

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

DESIGN OVERSIGHT

RAMON MARTINEZ

CALCULATED/DESIGNED BY

CHECKED BY

DATE

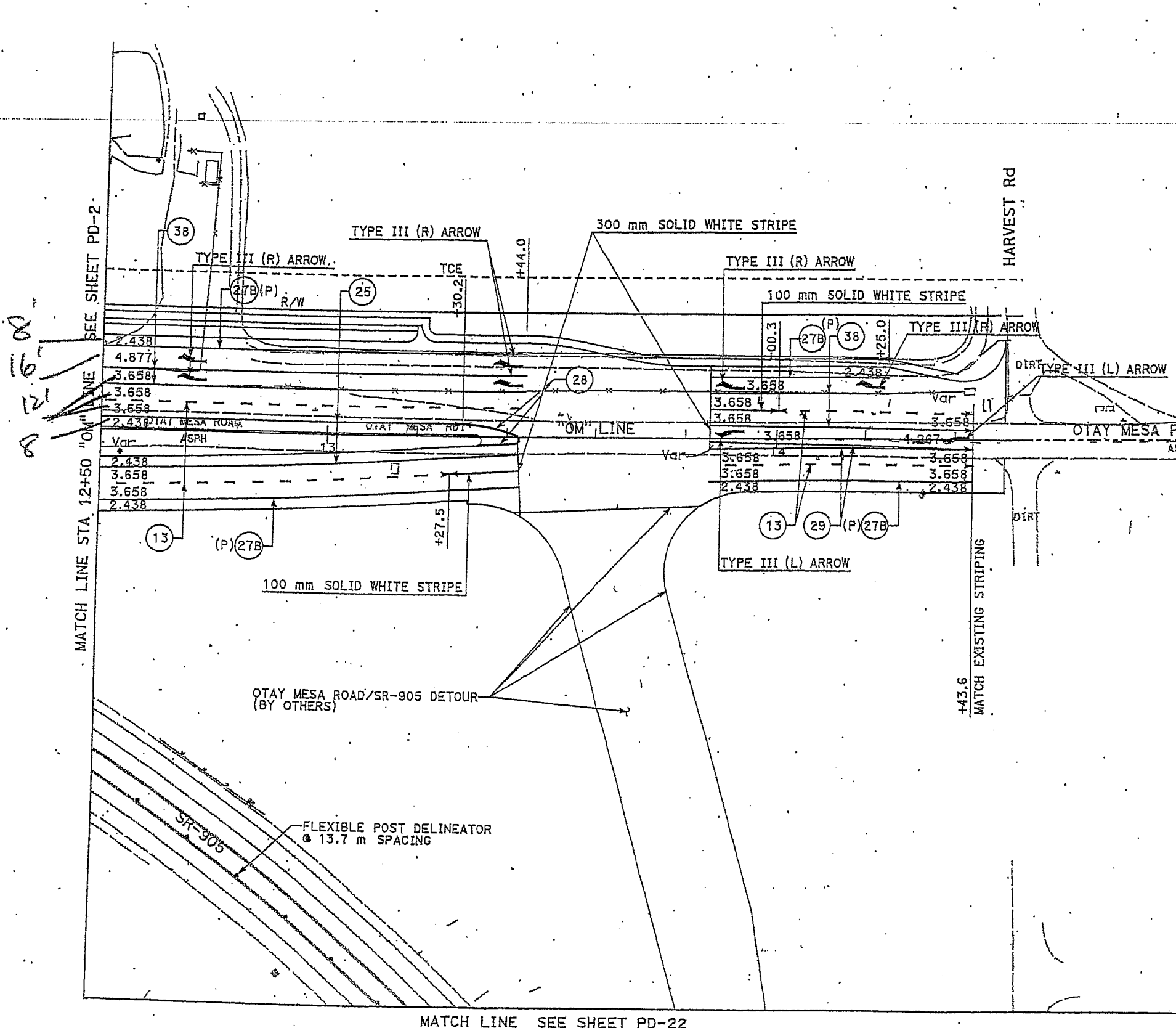
DATE

REVISED BY

DATE

REVISED BY

DATE



PLANS APPROVAL DATE

California Transportation Ventures, Inc.

880 Kuhn Drive

Chula Vista, CA 91914

REGISTERED

45704

12-31-06

CIVIL

STATE OF CALIFORNIA

EPL and Associates, Inc.

10 Corporate Park, Suite 310

Irvine, CA 92606

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Caltrans now has a web site! To get to the web site, go to: <http://www.dot.ca.gov>

ISSUE RECORD		
No.	PURPOSE	DATE
0	RELEASED FOR CONST. (RFR C-044) XXXXX06	

THIS PLAN ACCURATE FOR PAVEMENT DELINEATION WORK ONLY

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

USERNAME => Eddie Tang DGN FILE => ...\\1ana03.dgn	CU 11274	EA 232301	SEGMENT 1A
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PAVEMENT DELINEATION  
PLAN  
SCALE 1:500  
PD-3

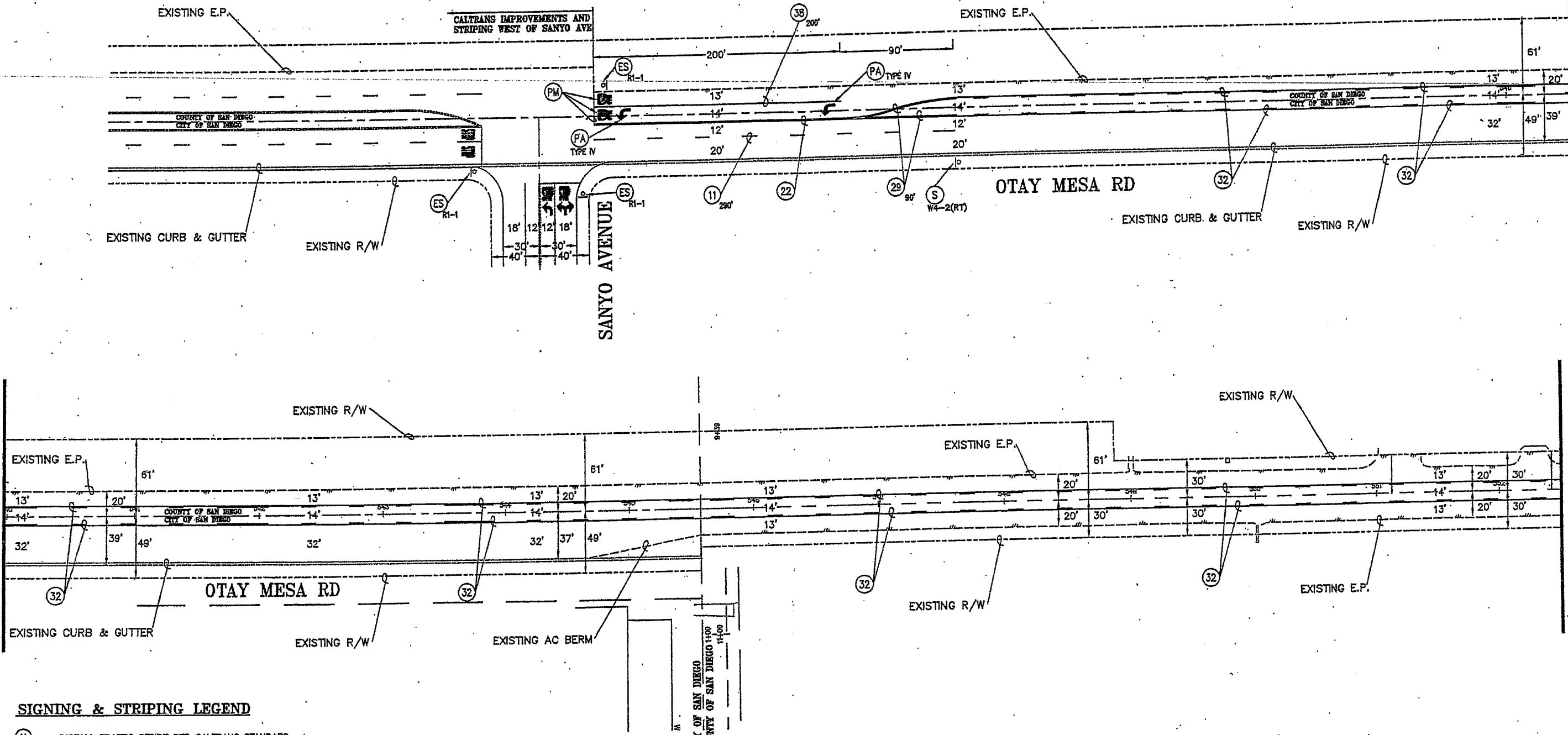
LAST REVISION: DATE PLOTTED => 9/12/2006  
 09-08-06 TIME PLOTTED => 10:44:12 AM  
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Proposed Improvements for Otay Mesa Road btwn Sanyo and Enrico Fermi

MATCHLINE SEE ABOVE RIGHT

MATCHLINE SEE STA 552+50, SHEET 2

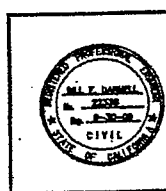
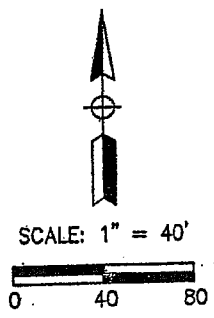
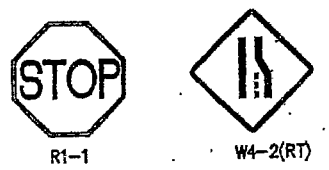
MATCHLINE SEE BELOW LEFT



**SIGNING & STRIPING LEGEND**

- (N) = INSTALL TRAFFIC STRIPE PER CALTRANS STANDARD PLAN A-20.
- (ES) = EXISTING SIGN SEE CALIFORNIA MUTCD
- (S) = INSTALL SIGN PER CALIFORNIA MUTCD
- (PA) = INSTALL TYPE IV (LT OR RT) ARROW PER CALTRANS STANDARD PLAN A24A.
- (PM) = PAINT STOP LEGEND AND 12" WHITE LIMIT LINE.
- (11) = INSTALL 4" WHITE SKIP LINE, PER DETAIL 11 OF CALTRANS STANDARD PLAN.
- (22) = INSTALL DOUBLE YELLOW CENTERLINE WITH PAVEMENT MARKERS PER DETAIL 22 OF CALTRANS STANDARD PLAN.
- (29) = INSTALL DOUBLE YELLOW MEDIAN WITH PAVEMENT MARKERS PER DETAIL 29 OF CALTRANS STANDARD PLAN.
- (32) = INSTALL TWO WAY LEFT TURN LANE PER DETAIL 32 OF CALTRANS STANDARD PLAN.
- (38) = INSTALL CHANNELIZING LANE WITH PAVEMENT MARKERS PER DETAIL 38 CALTRANS STANDARD PLAN.

**SIGNS LEGEND**



PLANS PREPARED UNDER THE SUPERVISION OF:  
BILL E. DARNELL R.C.E. No. 22338 DATE  
DESIGN ENGINEER LICENSE EXPIRES 9-30-09  
**Darnell & ASSOCIATES, INC.**  
1446 FRONT STREET, THIRD FLOOR  
SAN DIEGO, CA 92101  
(619) 233-9373  
DWG:051202CP-1A.dwg | DATE: 02-06-09 BY:SN/AM/SH

COUNTY APPROVED CHANGES			BENCH MARK	
No.	Description	Approved by	Date	

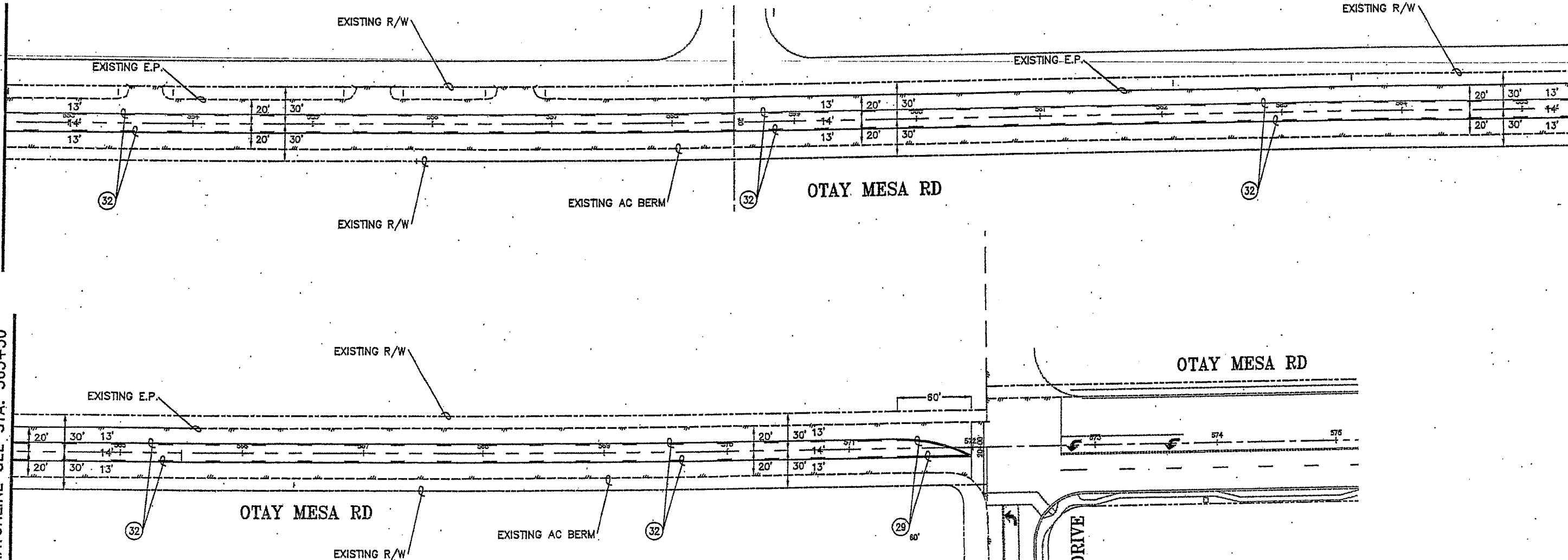
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SHEET 1	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	2 SHEETS
CHANNELIZATION CONCEPT		
SANYO AVE TO ENRICO FERM DRIVE		
CALIFORNIA COORDINATE INDEX 206-1791		
Recommended for approval:	Approved:	FOR DIRECTOR OF PUBLIC WORKS
Engineer of work:	Checked by:	
By:	Approved date:	
Date:	R.C.E.	

L-6

MATCHLINE STA. 552+50, SEE SHEET 1

MATCHLINE SEE STA. 565+50

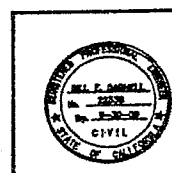
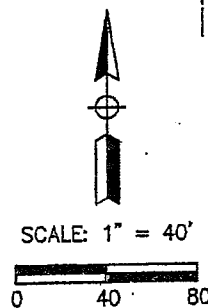
MATCHLINE SEE STA. 565+50



### SIGNING & STRIPING LEGEND

- (N) = INSTALL TRAFFIC STRIPE PER CALTRANS STANDARD PLAN A-20.
- XX = REPRESENTS DETAIL NUMBER. (PER CALTRANS STD. PLAN A-20).
- (ES) = EXISTING SIGN SEE CALIFORNIA MUTCD
- XX = REPRESENTS SIGN. (PER CALTRANS MUTCD)
- (S) = INSTALL SIGN PER CALIFORNIA MUTCD
- XX = REPRESENTS SIGN. (PER CALTRANS MUTCD)
- (PA) = INSTALL TYPE IV (LT OR RT) ARROW PER CALTRANS STANDARD PLAN A24A.
- (PM) = PAINT STOP LEGEND AND 12" WHITE LIMIT LINE.
- (11) = INSTALL 4" WHITE SKIP LINE, PER DETAIL 11 OF CALTRANS STANDARD PLAN.
- (22) = INSTALL DOUBLE YELLOW CENTERLINE WITH PAVEMENT MARKERS PER DETAIL 22 OF CALTRANS STANDARD PLAN.
- (29) = INSTALL DOUBLE YELLOW MEDIAN WITH PAVEMENT MARKERS PER DETAIL 29 OF CALTRANS STANDARD PLAN.
- (32) = INSTALL TWO WAY LEFT TURN LANE PER DETAIL 32 OF CALTRANS STANDARD PLAN.
- (38) = INSTALL CHANNELIZING LANE WITH PAVEMENT MARKERS PER DETAIL 38 CALTRANS STANDARD PLAN.

### SIGNS LEGEND



PLANS PREPARED UNDER THE SUPERVISION OF:  
**BILL E. DARNELL** R.C.E. No. 22338 DATE  
 DESIGN ENGINEER LICENSE EXPIRES 9-30-09  
**Darnell & Associates, Inc.**  
 1446 FRONT STREET, THIRD FLOOR  
 SAN DIEGO, CA 92101  
 (619) 233-9373  
 DWG:051202CP-1A.dwg DATE 02-08-09 BY:SN/AM/SM

COUNTY APPROVED CHANGES			BENCH MARK	
No.	Description	Approved by	Date	Description

PRIVATE CONTRACT			
SHEET <b>2</b>	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	2 SHEETS	
CHANNELIZATION CONCEPT			
SANTO AVE TO ENRICO FERM DRIVE			
CALIFORNIA COORDINATE INDEX 205-1791			
Recommended for approval:	Approved:	FOR DIRECTOR OF PUBLIC WORKS	
Engineer of work:	Checked by:		
By:	Date:	R.C.E.	Approval date:

L-7

Caltrans Striping Concept for La Media Road btwn Otay Mesa and Airway



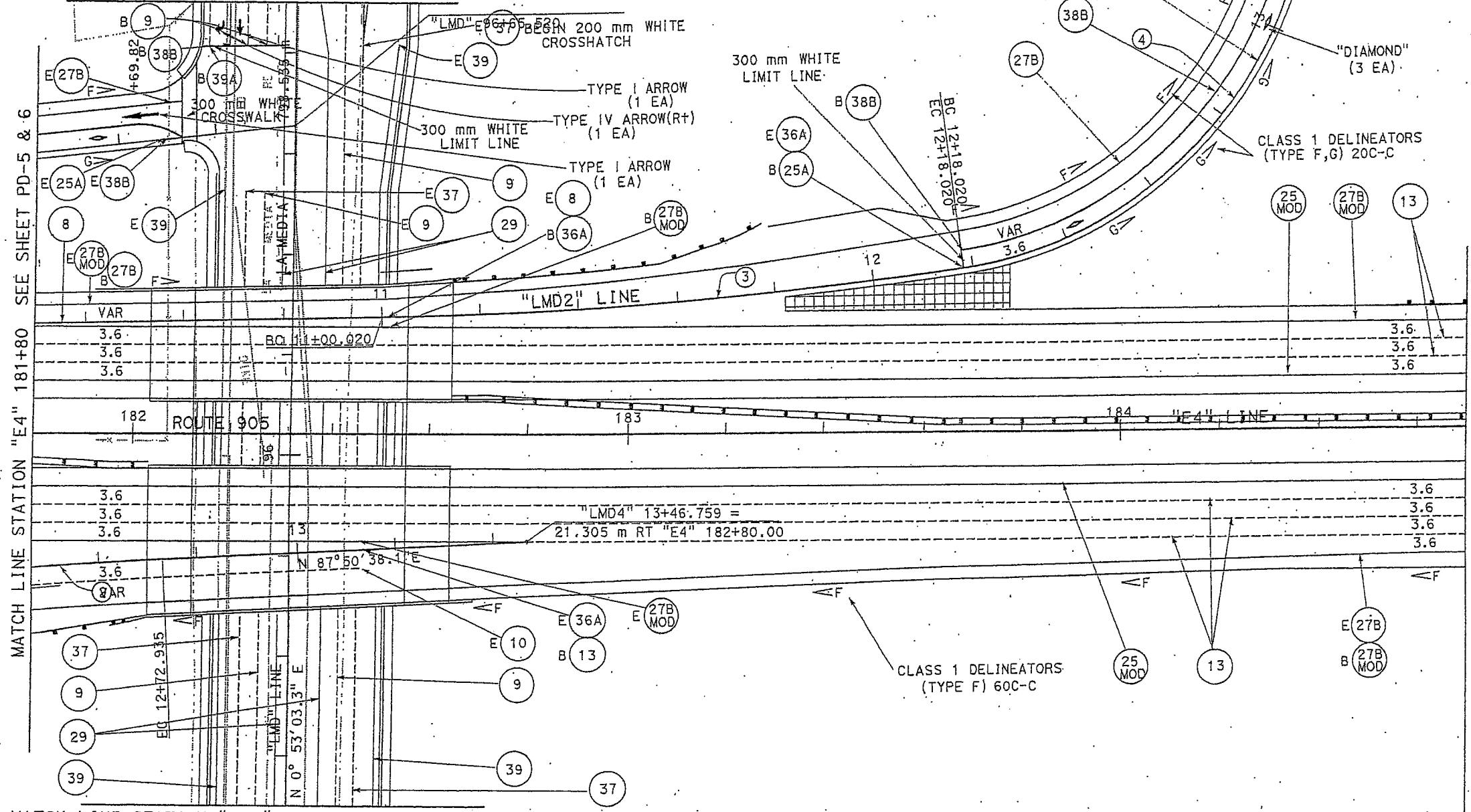


REGISTERED CIVIL ENGINEER DATE  
**PHASE 2 PLAN**  
9-17-07  
PLANS APPROVAL DATE  
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To get to the Caltrans web site, go to: <http://www.dot.ca.gov>

REGISTERED PROFESSIONAL ENGINEER  
J.P. SIMS  
No. 49715  
Exp. 9-30-08  
CIVIL  
STATE OF CALIFORNIA

MATCH LINE STATION "LMD" 96+90 SEE SHEET PD-21 & 22

MATCH LINE STATION "LMD2" 13+20 SEE SHEET PD-21 & 22



MATCH LINE STATION "LMD" 95+30 SEE SHEET PD-19 & 20

MATCH LINE STATION "E4" 184+70 SEE SHEET PD-8 & 9

**PAVEMENT DELINEATION  
AND SIGN PLAN**

**PD- 7**

THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

SCALE 1:500

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS  
0 20 40 60 80  
USERNAME => tralence  
DGN FILE => 09182nd007.dgn

CU 11227 EA 091821

L-10

OTTED => 17-SEP-2007  
LOTTED => 13:12  
LAST REVISION  
02-09-06



REGISTERED CIVIL ENGINEER DATE  
**PHASE 2 PLAN**  
9-17-07  
PLANS APPROVAL DATE

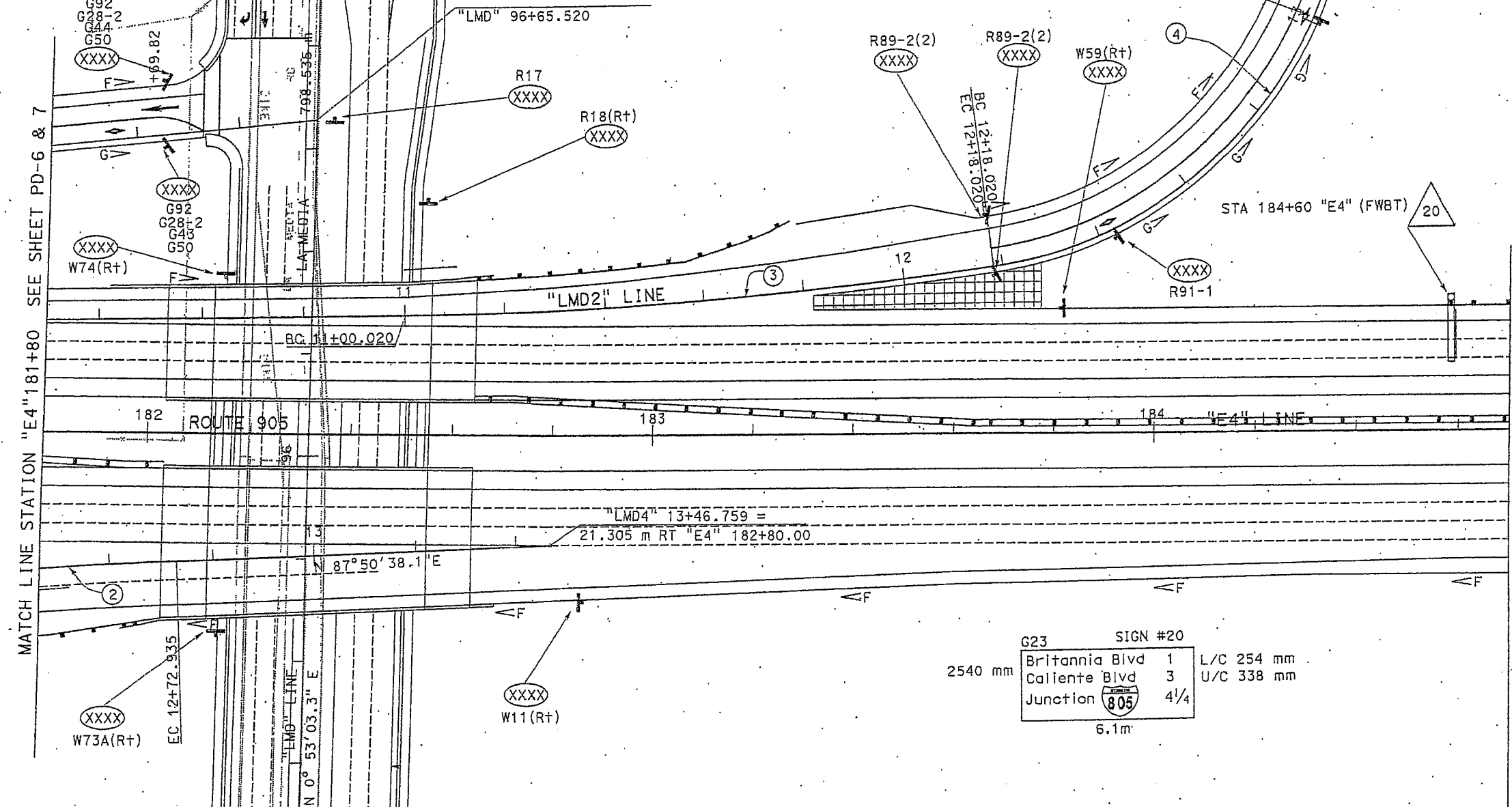
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REGISTERED PROFESSIONAL ENGINEER  
J.P. SIMS  
No. 49715  
Exp. 9-30-08  
CIVIL  
STATE OF CALIFORNIA

MATCH LINE STATION "LMD" 96+90 SEE SHEET PD-21 & 22

MATCH LINE STATION "LMD" 13+20 SEE SHEET PD-21 & 22



G23 SIGN #20

2540 mm	Britannia Blvd	1	L/C 254 mm
	Caliente Blvd	3	U/C 338 mm
	Junction	4 1/4	

6.1m

PAVEMENT DELINEATION  
AND SIGN PLAN

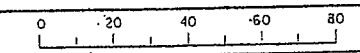
PD- 8

THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

SCALE 1:500

FOR REDUCED PLANS ORIGINAL  
SCALE IS IN MILLIMETERS



USERNAME => trpierce  
DGN FILE => b09182na008.dgn

CU 11227

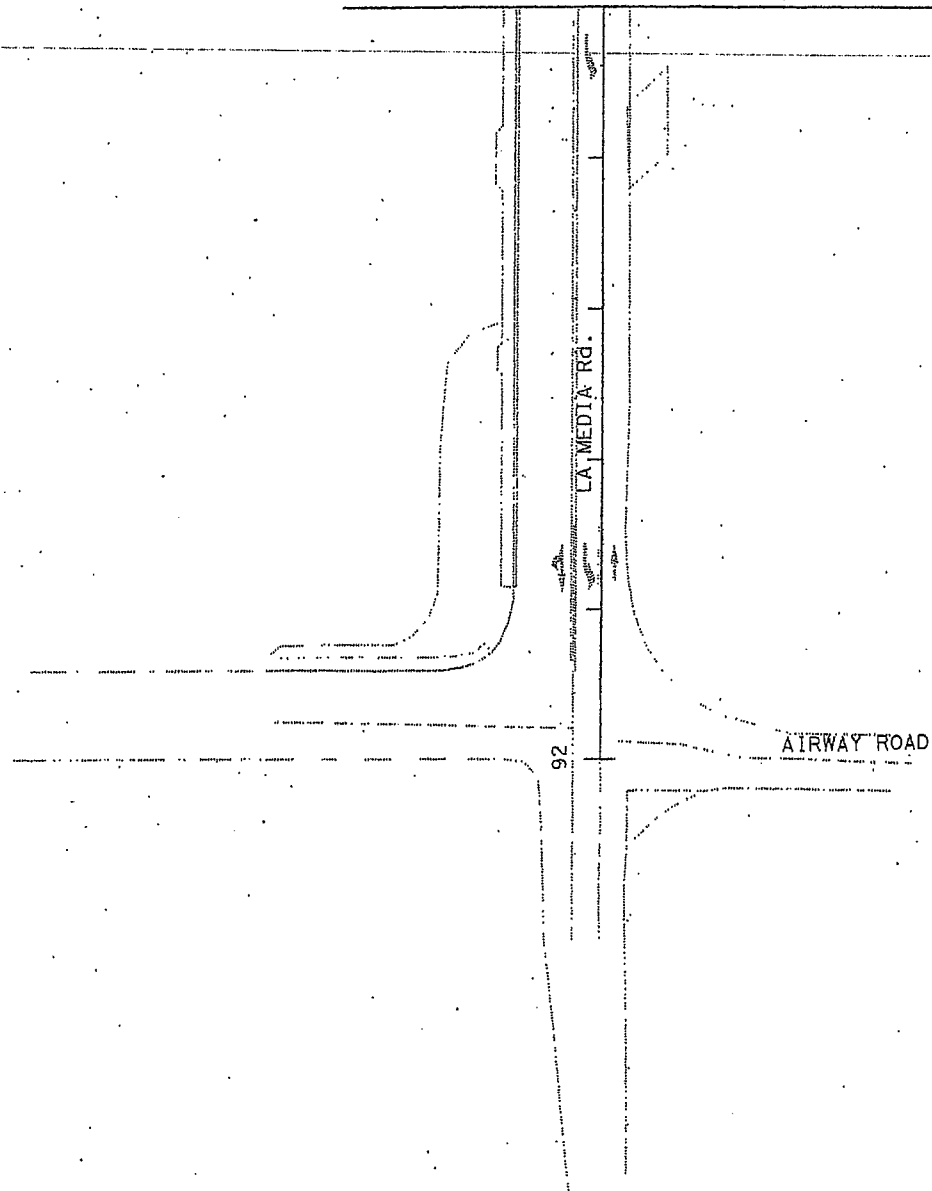
EA 091821

LAST REVISION: 02-09-06  
DATE PLOTTED: 07-17-SEP-2007  
TIME PLOTTED: 02:35:42

L-11

<div>STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION</div> <div><i>Caltrans</i></div>	PROJECT ENGINEER		CALCULATED/ DESIGNED BY	MBH	DATE	REVISED BY	DATE	REVISED BY	DATE	REVISED BY	DATE
	J.P. SIMS										
	TRAFFIC		CHECKED BY		DATE		DATE		DATE		DATE

MATCH LINE STATION "LMD" 93+00 SEE SHEET PD-19 & 20



REGISTERED CIVIL ENGINEER DATE  
**PHASE 2 PLAN**  
 9-17-07  
 PLANS APPROVAL DATE  
 J.P. SIMS  
 No. 49715  
 Exp. 9-30-08  
 CIVIL  
 STATE OF CALIFORNIA  
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FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS

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USERNAME => trlpierce  
DGN FILE => 09182na018.dgn

THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

SCALE 1:500

PAVEMENT DELINEATION  
AND SIGN PLAN

PD - 18

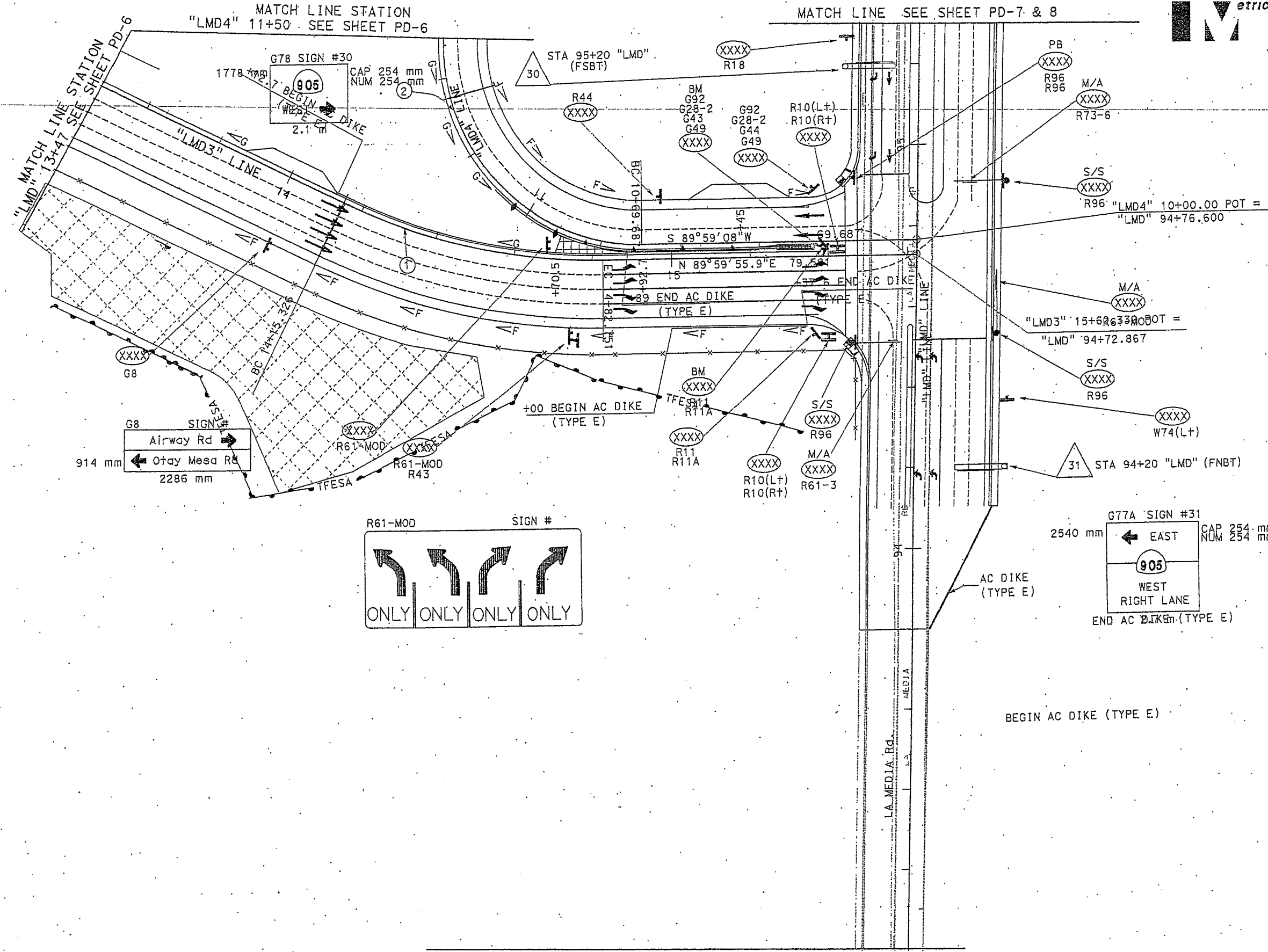
CU 11227 EA 091821

L-12

LAST REVISION DATE PLOTTED => 17-SEP-2007  
02-09-06 TIME PLOTTED => 13:44



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
Caltrans  
PROJECT ENGINEER  
J.P. SIMS  
DATE  
REVISED BY  
DATE  
REVISOR  
CHECKED BY  
DATE  
REVISOR

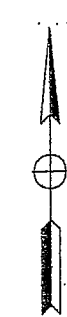


REGISTERED CIVIL ENGINEER DATE  
J.P. SIMS  
No. 49715  
Exp. 9-30-08  
CIVIL  
STATE OF CALIFORNIA

9-17-07  
PLANS APPROVAL DATE

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MATCH LINE STATION "LMD" 93+00 SEE SHEET PD-18

PAVEMENT DELINEATION  
AND SIGN PLAN

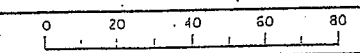
PD-20

THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

SCALE 1:500

FOR REDUCED PLANS ORIGINAL  
SCALE IS IN MILLIMETERS



USERNAME => hroierce  
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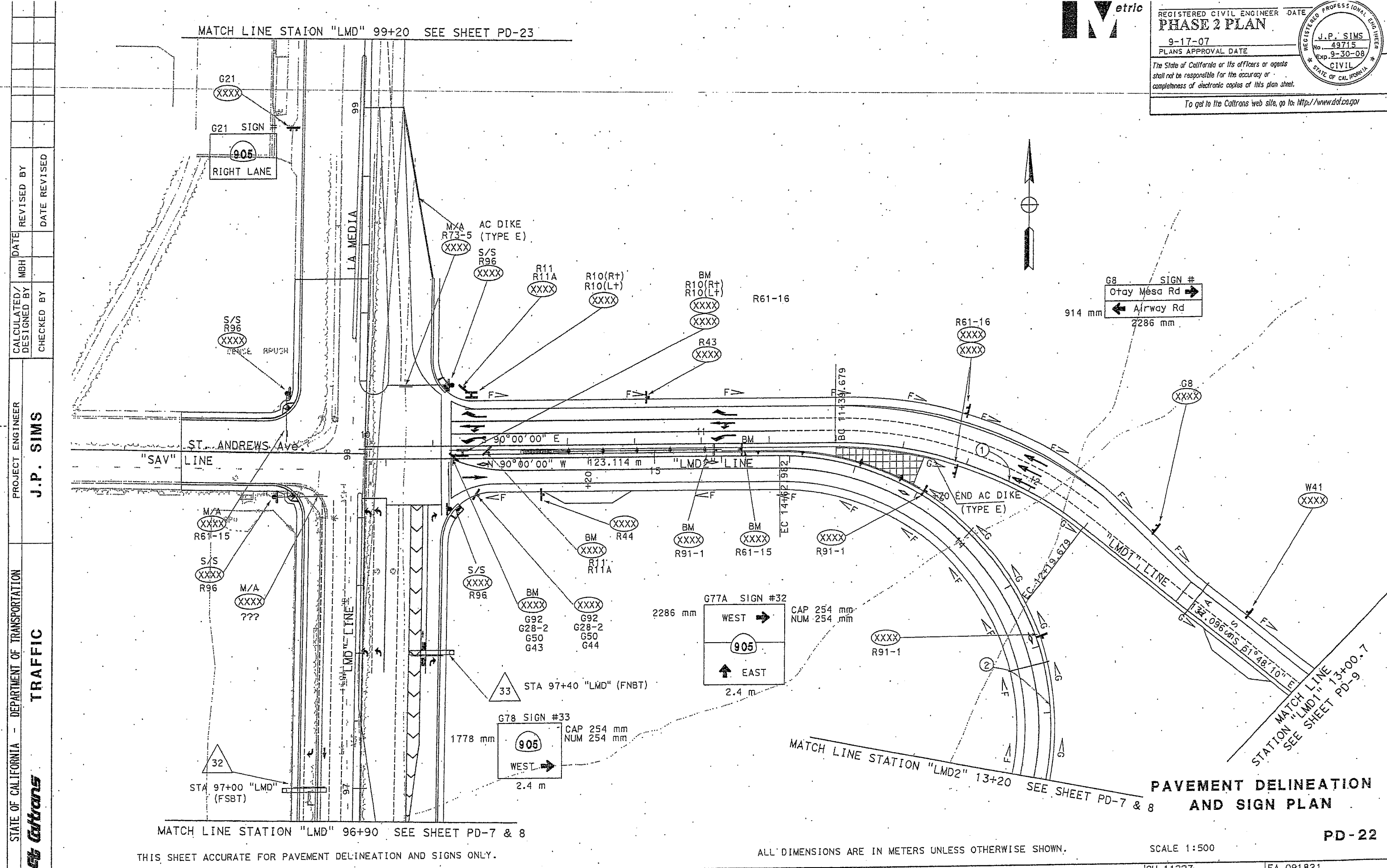
CU 11227

EA 091821


L-14

DATE PLOTTED => 17-SEP-2007  
TIME PLOTTED => 13:44  
02-09-06

·|EA 091821



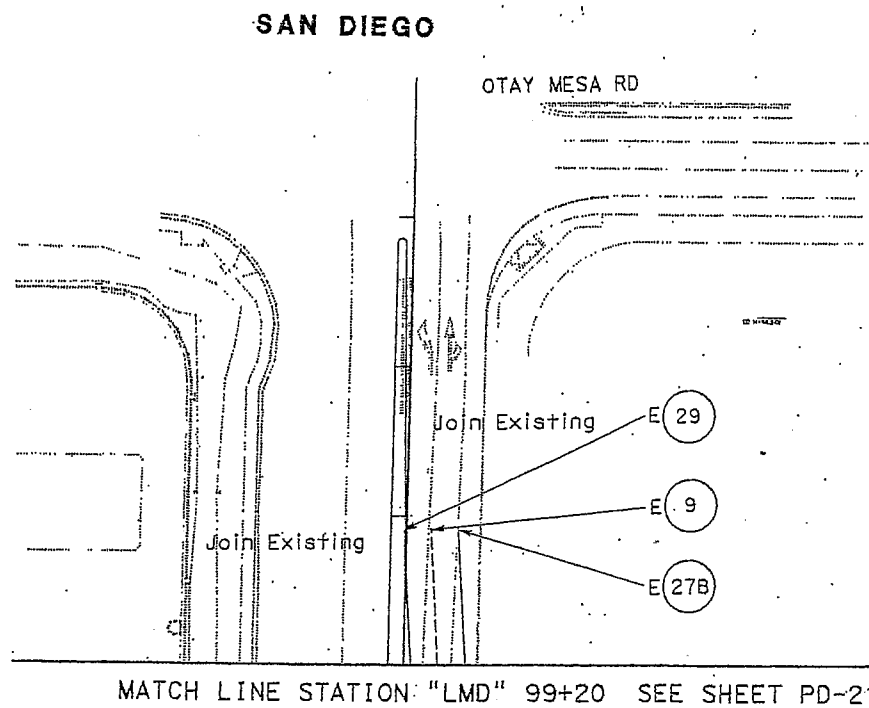
L-16

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	PROJECT ENGINEER		CALCULATED/ DESIGNED BY	MBH	DATE	REVISED BY				
 <b>Caltrans</b>	TRAFFIC		CHECKED BY			DATE REVISED				



REGISTERED CIVIL ENGINEER DATE  
**PHASE 2 PLAN**  
9-17-07  
PLANS APPROVAL DATE  
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To get to the Caltrans web site, go to: <http://www.dot.ca.gov>

REGISTERED PROFESSIONAL ENGINEER  
J.P. SIMS  
No. 49715  
Exp. 9-30-08  
CIVIL  
STATE OF CALIFORNIA



MATCH LINE STATION: "LMD" 99+20 SEE SHEET PD-21

**PAVEMENT DELINEATION  
AND SIGN PLAN**

THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

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SCALE 1:500 **L-17** PD-23

Caltrans Striping Concepts for Airway Road btwn Harvest and Sanyo

SAN DIEGO

PAVEMENT DELINEATION  
AND SIGN PLAN

PD - 13

SCALE 1:500

THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL  
SCALE IS IN MILLIMETERS0 20 40 60 80  
1" = 20MUSERNAME => hplance  
DGN FILE => b09182n013.dgn

CU 11227

EA 091821

LAST REVISION  
02-09-06  
NOTED 02-13-07  
L-19

To get to the Caltrans web site, go to: <http://www.dot.ca.gov>

LINE STATION "E6" 202+40  
SEE SHEET PD-13 & 15

MATCH LINE STATION "SV3P2" 14+30

PD - 14

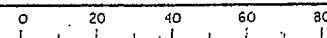
ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1 : 500

CU 11227

EA 091821

FOR REDUCED PLANS ORIGINAL  
SCALE IS IN MILLIMETERS



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USERNAME => trpierce
DGN FILE => b00132na014.dgn

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L-20

DATE PLOTTED => 17-SEP-2007
TIME PLOTTED => 13:43

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

TRAFFIC

PROJECT ENGINEER

J.P. SIMS

CALCULATED/ DESIGNED BY	DATE	REVISD BY
MBH		
CHECKED BY		DATE REVISED

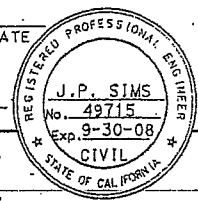


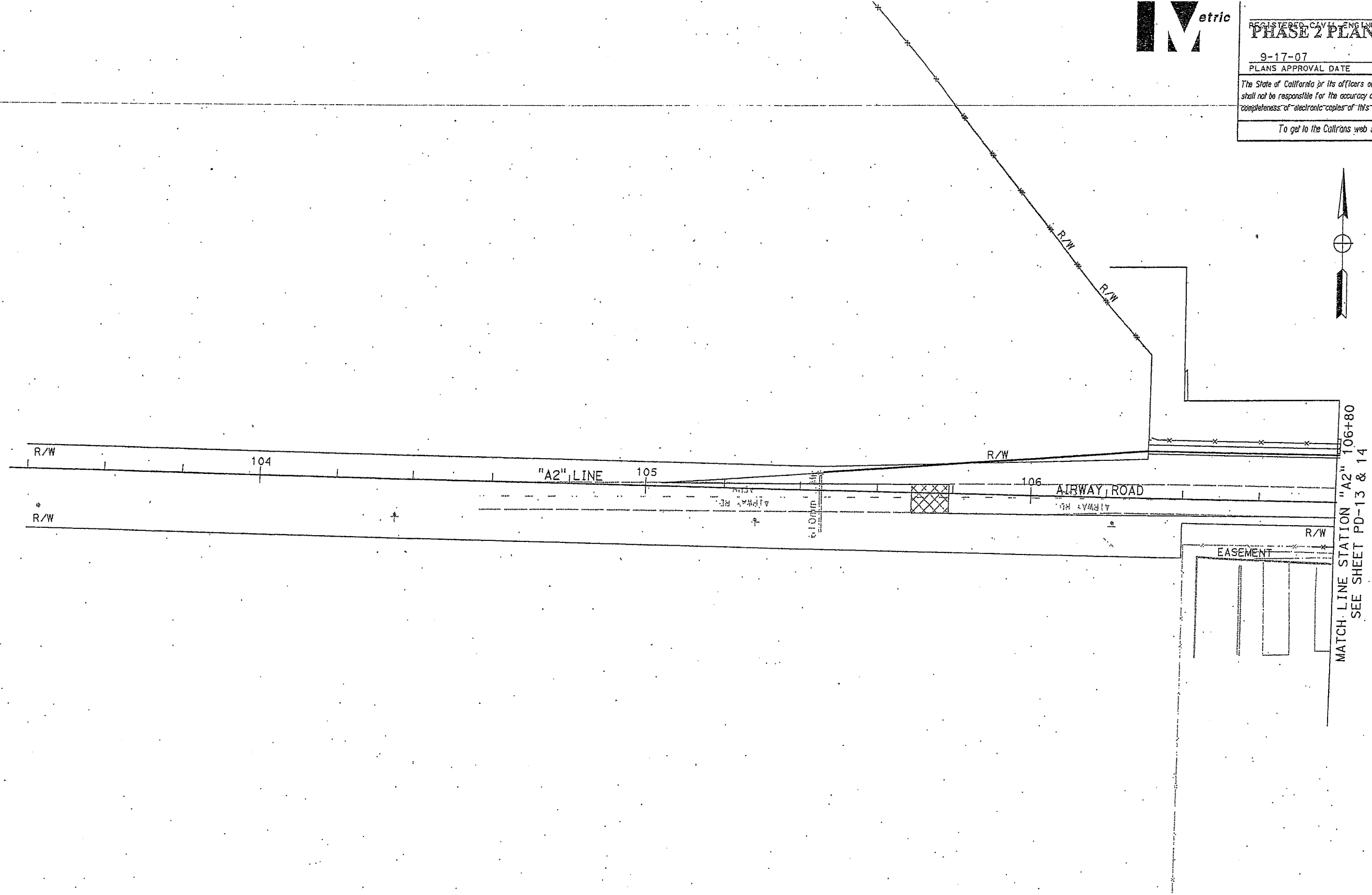
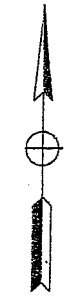
REGISTERED CIVIL ENGINEER DATE  
**PHASE 2 PLAN**

9-17-07  
PLANS APPROVAL DATE

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MATCH LINE STATION "A2" 106+80  
SEE SHEET PD-13 & 14

PAVEMENT DELINEATION  
AND SIGN PLAN

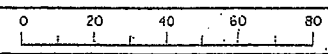
PD-34

THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

SCALE 1:500

FOR REDUCED PLANS ORIGINAL  
SCALE IS IN MILLIMETERS



USERNAME => frplance  
DGN FILE => 009132n034.dgn

CU 11227 EA 091821

LAST REVISION DATE PLOTTED => 17-SEP-2007  
02-09-06 TIME PLOTTED => 13:45

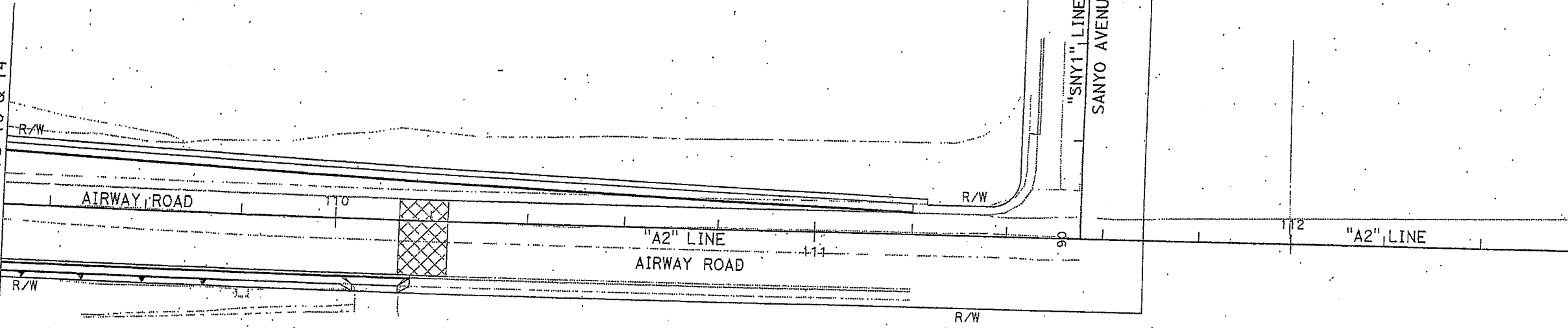
L-21

PROJECT ENGINEER  
**J.P. SIMS**

CALCULATED/ DESIGNED BY	DATE	REVISD BY	DATE
MBH			
CHECKED BY		DATE REVISED	

THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

MATCH LINE STATION "A1" 109+30  
 SEE SHEET PD-13 & 14



MATCH LINE STATION "SNY1" 91+00 SEE SHEET PD-33



**PAVEMENT DELINEATION  
 AND SIGN PLAN**

**PD-35**

SCALE 1:500

FOR REDUCED PLANS ORIGINAL  
 SCALE IS IN MILLIMETERS

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

USERNAME => fpierce  
 DGN FILE => b09182na035.dgn

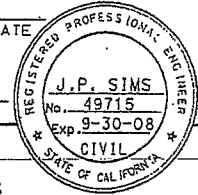
CU 11227

EA 091821

L-22



REGISTERED CIVIL ENGINEER	DATE
<b>PHASE 2 PLAN</b>	
9-17-07	
PLANS APPROVAL DATE	
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To get to the Caltrans web site, go to: <a href="http://www.dot.ca.gov">http://www.dot.ca.gov</a>	



OTED => 17-SEP-2007  
 LOTTED => 13:45  
 02-09-06 11

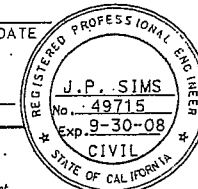
Caltrans Striping Concept for Britannia Blvd btwn Otay Mesa Rd and Airway Rd

PRELIMINARY FOR BIDDING PURPOSES ONLY



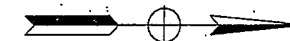
DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	SD	905	R13.9/R18.6	633	895

REGISTERED CIVIL ENGINEER DATE  
**PHASE 2 PLAN**  
9-17-07  
PLANS APPROVAL DATE

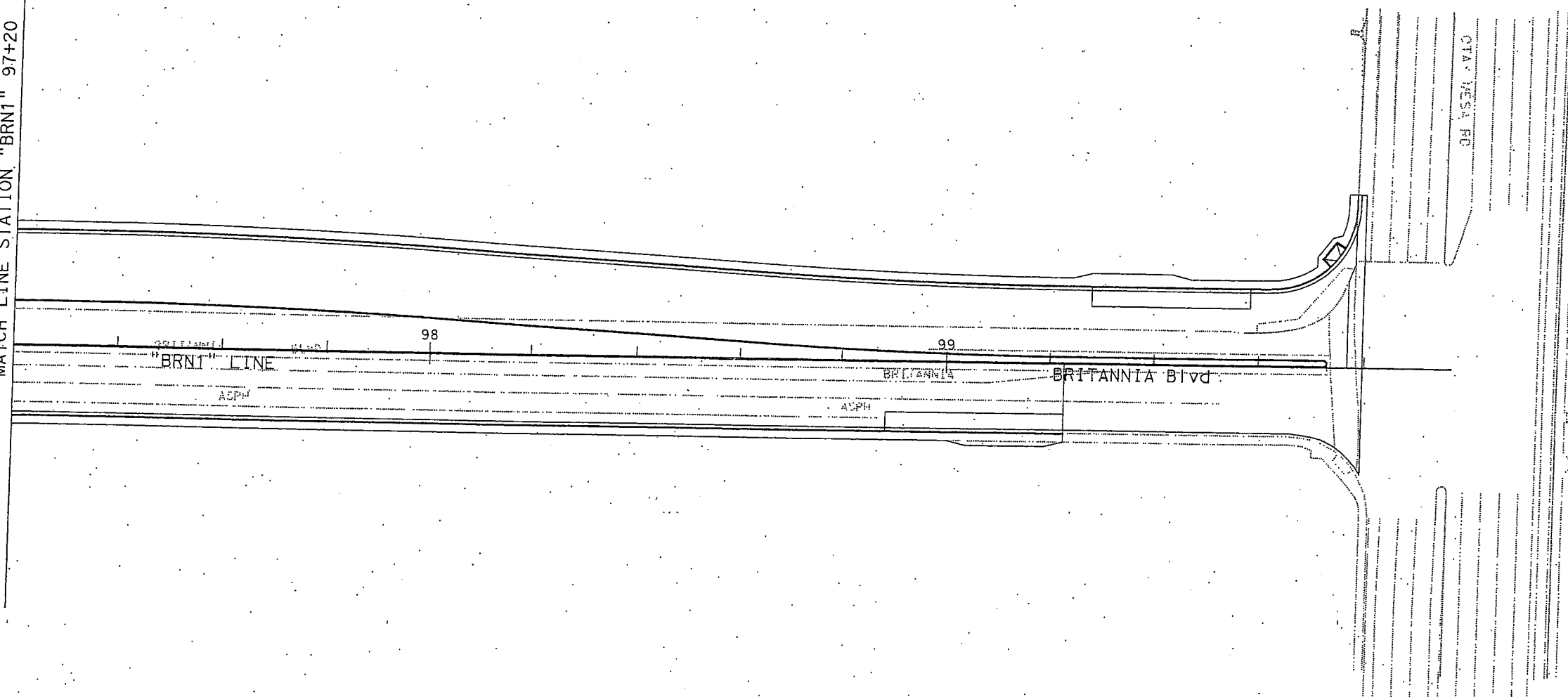


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To get to the Caltrans web site, go to: <http://www.dot.ca.gov>



MATCH LINE STATION "BRN1" 97+20 SEE SHEET PD-1 & 2



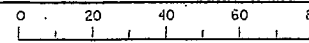
PAVEMENT DELINEATION  
AND SIGN PLAN

SCALE 1:500 **L-24** PD-17

THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

FOR REDUCED PLANS ORIGINAL  
SCALE IS IN MILLIMETERS



USERNAME => trpierce  
DGN FILE => b09182na017.dgn

CU 11227

EA 091821

LAST REVISION 02-09-06  
NOTED => 17-SEP-2007  
NOTED => 13:43

# PRELIMINARY FOR BIDDING PURPOSES ONLY

MATCH LINE STATION "BRN1" 97+20

SEE SHEET PD-17



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	SD	905	R13.9/R18.6	617	895

REGISTERED CIVIL ENGINEER DATE  
**PHASE 2 PLAN**  
 9-17-07  
 PLANS APPROVAL DATE  
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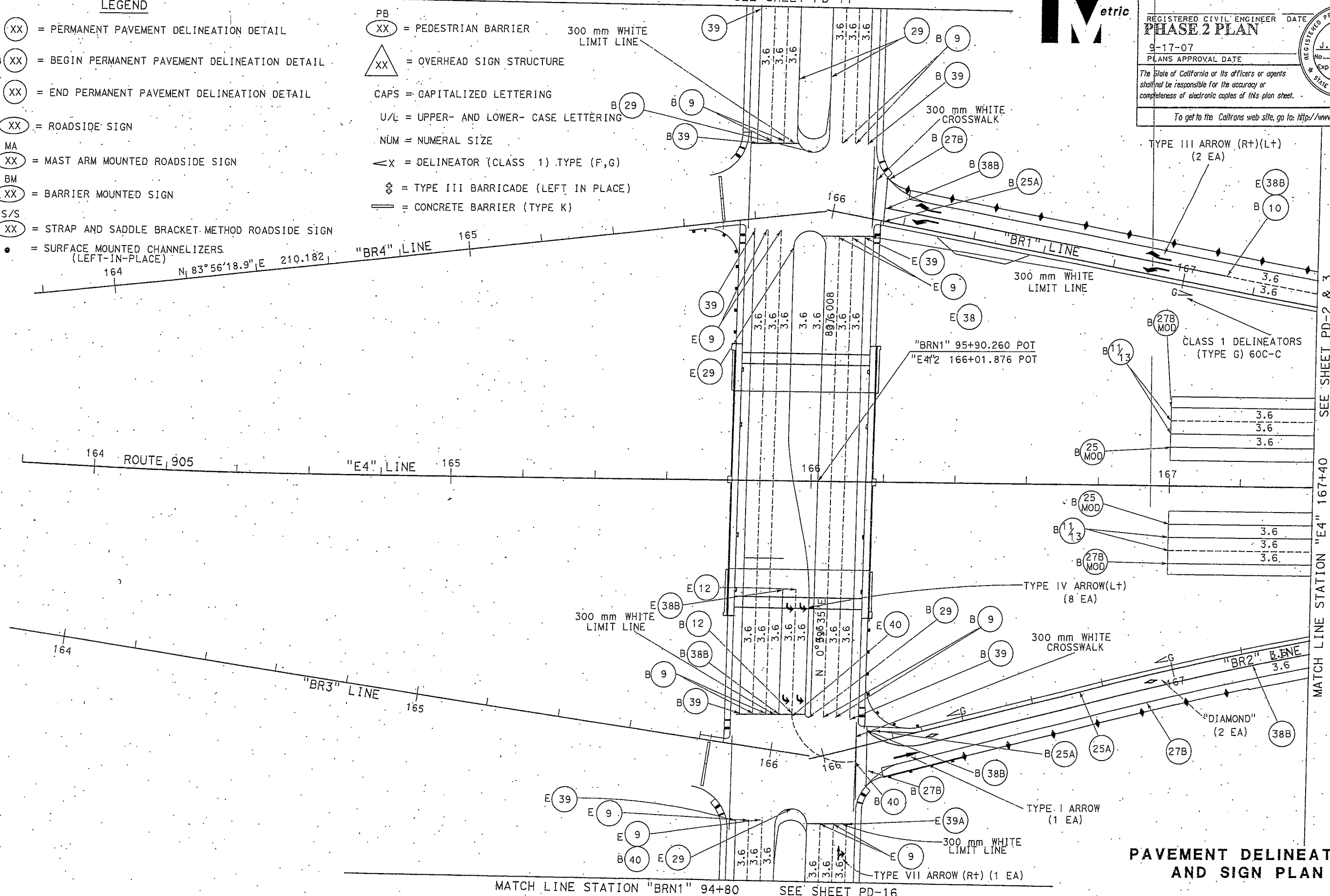
- LEGEND**
- XX = PERMANENT PAVEMENT DELINEATION DETAIL
  - B XX = BEGIN PERMANENT PAVEMENT DELINEATION DETAIL
  - E XX = END PERMANENT PAVEMENT DELINEATION DETAIL
  - XX = ROADSIDE SIGN
  - MA XX = MAST ARM MOUNTED ROADSIDE SIGN
  - BM XX = BARRIER MOUNTED SIGN
  - S/S XX = STRAP AND SADDLE BRACKET METHOD ROADSIDE SIGN
  - = SURFACE MOUNTED CHANNELIZERS (LEFT-IN-PLACE)
  - PB XX = PEDESTRIAN BARRIER
  - XX = OVERHEAD SIGN STRUCTURE
  - CAPS = CAPITALIZED LETTERING
  - U/L = UPPER- AND LOWER- CASE LETTERING
  - NUM = NUMERAL SIZE
  - X = DELINEATOR (CLASS 1) TYPE (F,G)
  - ⚡ = TYPE III BARRICADE (LEFT IN PLACE)
  - == = CONCRETE BARRIER (TYPE K)

DATE REVISOR BY  
 MBH  
 CHECKED BY

PROJECT ENGINEER  
**J.P. SIMS**

DEPARTMENT OF TRANSPORTATION  
**TRAFFIC**

**Caltrans**



MATCH LINE STATION "BRN1" 94+80

SEE SHEET PD-16

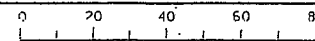
THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

**PAVEMENT DELINEATION AND SIGN PLAN**

SCALE 1:500 **L-25** **PD-1**

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS



USERNAME => tranada  
 DGN FILE => p09182nd001.dgn

CU 11227

EA 091821

DATE 17-SEP-2007  
 TIME 10:57

LAST REVISION 03/11/07

LAST REVISION	DATE PLOTTED =>17-SEP-2007
03/11/07	TIME PLOTTED =>10:57

PRELIMINARY FOR BIDDING PURPOSES ONLY



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	SD	905	R13.9/R18.6	632	895

REGISTERED CIVIL ENGINEER	DATE
<b>PHASE 2 PLAN</b>	
9-17-07	
PLANS APPROVAL DATE	

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

To get to the Caltrans web site, go to: <http://www.dot.ca.gov>

REGISTERED PROFESSIONAL ENGINEER

J.P. SIMS

No. 49715

Exp. 9-30-08

CIVIL

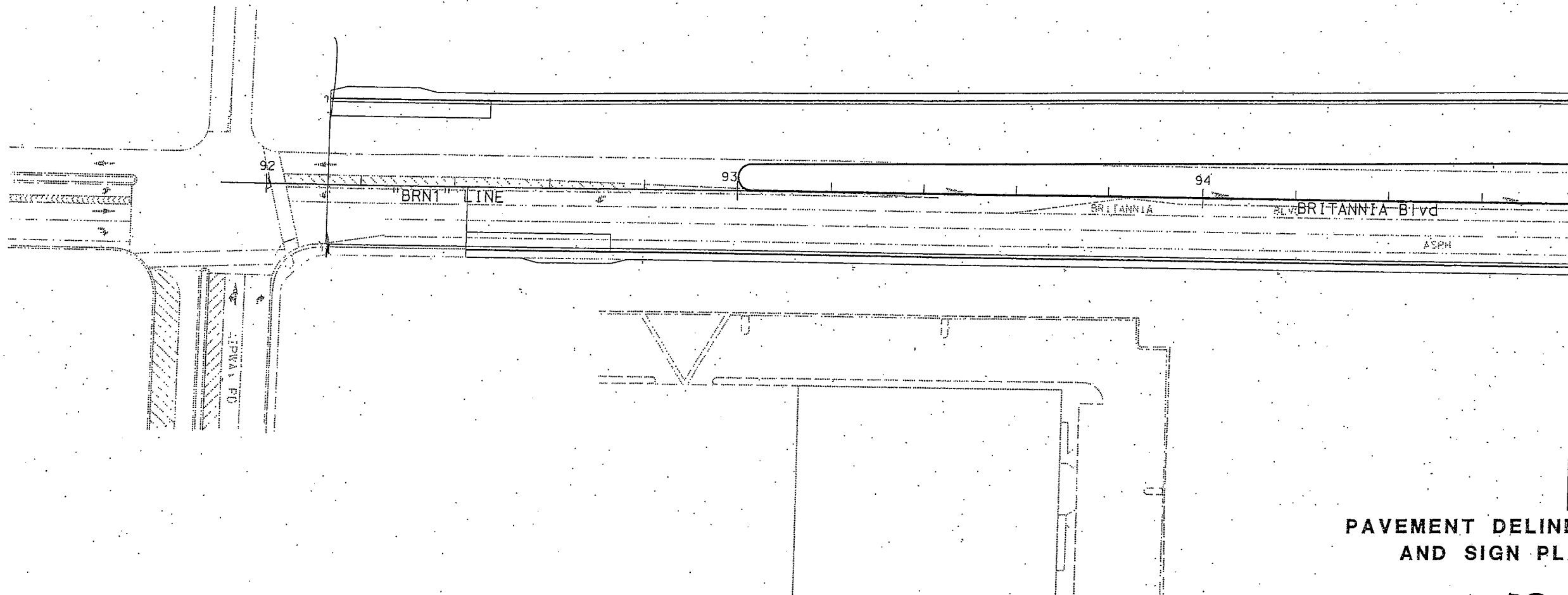
STATE OF CALIFORNIA

PROJECT ENGINEER  
**J.P. SIMS**

DEPARTMENT OF TRANSPORTATION  
**TRAFFIC**

STATE OF CALIFORNIA  
**Caltrans**

CALCULATED/DESIGNED BY	DATE	REVISOR	DATE
MBH			
CHECKED BY			
DATE			



MATCH LINE STATION "BRN1" 94+80 SEE SHEET PD-1 & 2

PAVEMENT DELINEATION  
AND SIGN PLAN

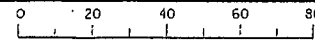
THIS SHEET ACCURATE FOR PAVEMENT DELINEATION AND SIGNS ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

SCALE 1:500

**L-27 PD-16**

FOR REDUCED PLANS ORIGINAL  
SCALE IS IN MILLIMETERS



USERNAME => trpierce  
DCN FILE => 009182na016.dgn

CU 11227

EA 091821

LAST REVISION: 02-09-06  
DATE PLOTTED: 02-09-06  
TIME PLOTTED: 13:43

## **APPENDIX M**

- Approved Design Exception Request
- Hawano Drive North Access Memo

Approved Design Exception Request



# County of San Diego

## DEPARTMENT OF PUBLIC WORKS

RICHARD E. CROMPTON  
DIRECTOR

5201 RUFFIN ROAD, SUITE D  
SAN DIEGO, CALIFORNIA 92123-4310  
(858) 694-2055 FAX: (858) 694-8928  
Web Site: [sdcounty.ca.gov/dpw/](http://sdcounty.ca.gov/dpw/)

October 7, 2011

KIMLEY-HORN AND ASSOCIATES, INC

Attn: Adam Corral, P.E.  
401 B Street, Suite 600,  
San Diego, CA 92101

REQUEST FOR DESIGN EXCEPTION TO A ROAD STANDARD AND/OR  
MODIFICATION TO PROJECT CONDITIONS – HAWANO DRIVE NORTH/ SOUTH  
CUL-DE-SACS ROADS AND DRIVEWAYS CENTERLINE SEPARATION, EAST OTAY  
MESA, TM 5566 – KIVA 10-0123176

Dear Mr. Corral:

Department of Public Works (DPW) reviewed your application package and Assessment of the Siempre Viva Road/ Hawano Drive North Access, prepared by Darnell & Associates, dated August 19, 2011 for the Exceptions Request to the Public Road Standards.

The requested design exceptions were as follows:

1. Allow modification of Public Road Standards, Sec. 4.5.J. for proposed Hawano Drive North and Hawano Drive South, Industrial/ Commercial Cul-De-Sac Roads to exceed the average daily vehicular trips (ADT) of 1,000 ADTs. The projected traffic for Hawano Drive North and Hawano Drive South is 5,319 ADT and 3,410 ADTs, respectively.
2. Allow modification of Public Road Standards, Section 6.1.C.3 to allow centerline separations of less than 600 feet into Alta Road, a circulation element road, between Siempre Viva Road, a circulation element road, and the proposed shared driveways on Lots 11-12; and between Airway Road, a circulation element road, and the proposed shared driveways on Lots 9-10.

DPW is able to support your request for design exceptions to the above project conditions. The project shall provide the following roads mitigation conditions:

1. The proposed Hawano Drive North cul-de-sac shall provide a 310-foot long left-turn pocket along the eastbound direction of Siempre Viva Road and place a 50-foot long no-parking/ red curb restriction at the northwest corner of the Siempre Viva Road/ Hawano Drive North intersection in order to accommodate the truck turning movements.
2. The Siempre Viva Road/ Hawano Drive North intersection shall be signalized.
3. The project's driveways along Alta Road shall be designed to have a maximum possible separation of 300 feet or more between other driveways or intersections. Adequate sight distance, in both directions shall be provided at each driveway pursuant to the prevailing speeds along, Alta Road. Hawano Drive North and Hawano Drive South to the satisfaction of the Director of Public Works.
4. Based on previous supported design exception requests for East Otay Mesa development, DPW will allow centerlines separation of a minimum 100-foot between driveways accessing Industrial/Commercial Cul-De-Sac Roads. Adequate sight distance in both directions shall be provided at each driveway pursuant to the prevailing speeds along Hawano Drive North and Hawano Drive South including driveways entering the cul-de-sacs to the satisfaction of the Director of Public Works.

It has been determined your request for design exceptions will not adversely affect the safety and flow of traffic in this area.

If you have any questions or need additional information related to this request, please contact Edwin M. Sinsay, Team Leader at (858) 694-2486 or via e-mail at [edwin.sinsay@sdcounty.ca.gov](mailto:edwin.sinsay@sdcounty.ca.gov).

Sincerely,



TROY BANKSTON, Deputy Director  
Department of Public Works

CC: Gail Wright, Project Manager, Department of Planning and Land Use, M.S. 0650  
Rosemary Rowan, Planning Manager, DPLU, M.S. 0650  
Bob Goralka, County Traffic Engineer, DPW, M.S. 0338  
Ricardo Jinich, Paragon, 4370 La Jolla Village Dr., Suite 640, San Diego, CA 92122  
Bill Darnell, 2870 Fourth Avenue, Suite A, San Diego, CA 92103

**Hawano Drive North Access Memo**

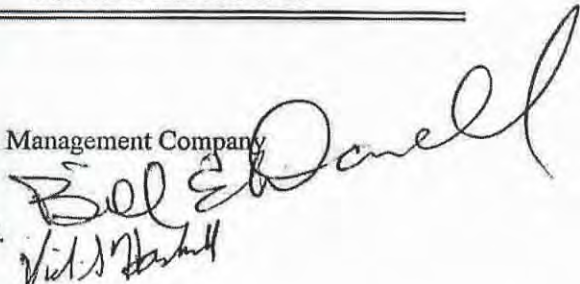
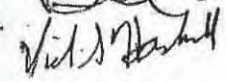
# Darnell & ASSOCIATES, INC.

TRANSPORTATION PLANNING & TRAFFIC ENGINEERING

## MEMORANDUM

DATE: August 19, 2011

TO: Dan Berkus, Paragon Management Company

FROM: Bill E. Darnell, P.E.   
Vicki S. Haskell, P.E. 

D&A Ref. No: 091201

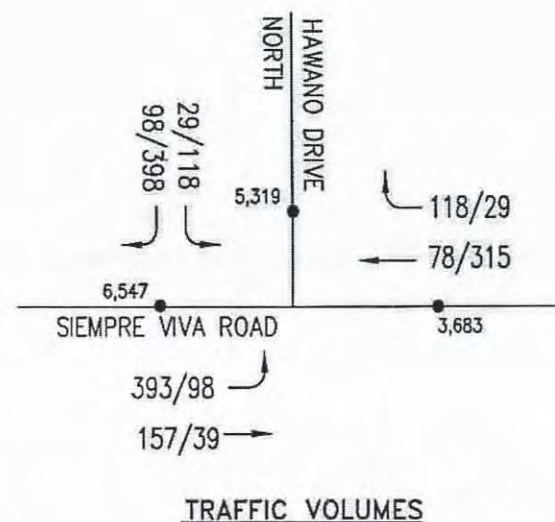
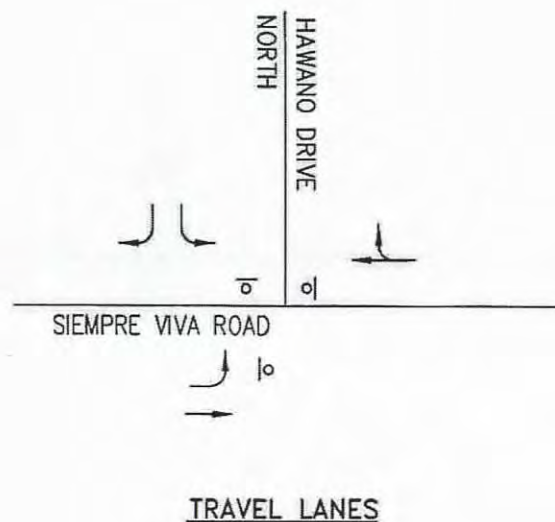
RE: Hawano (TM 5566; ER 93-19-006OO) – Revised Assessment of the Siempre Viva Road/Hawano Drive North Access

In response to the County of San Diego's August 10, 2010 comment letter, Darnell & Associates, Inc. (D&A) has provided some additional analysis related to the Siempre Viva Road/Hawano Drive North Access. This revised memo provides the requested all-way stop-control warrant analysis, the buildout traffic volumes, and the updated queuing analysis which incorporates the projected truck demand.

As was addressed previously, D&A has carefully reviewed the traffic distribution and circulation for the proposed Hawano project to determine the access requirements for the Siempre Viva Road/Hawano Drive North intersection assuming that there would be a median break allowed on Siempre Viva Road. Minor revisions to the traffic distribution from what was previously illustrated in our March 30, 2011 traffic study report were made to allow for more project traffic utilization of the segment of Airway Road between Siempre Viva Road and Alta Road. Figure A provides an illustration of the updated existing plus project Phases 1-2 traffic volumes.

In their August 10, 2010 comment letter, the County asked for an illustration of the buildout peak hour traffic volumes that would exist at the Siempre Viva Road/Hawano Drive North Access. To estimate the peak hour buildout traffic volumes, D&A referenced the 2035 peak hour traffic volumes (with the two interchange alternative) from the November 2010 *Traffic Technical Report for State Route 11 and the Otay Mesa East Port of Entry* which was prepared by VRPA Technologies. Specifically, the peak hour volumes at the Siempre Viva Road/Alta Road intersection were utilized to determine the through traffic at the Siempre Viva Road/Hawano Drive North Access. Figure B provides an illustration of the buildout plus project Phases 1-2 traffic volumes.

The Siempre Viva Road/Hawano Drive North intersection was reanalyzed under existing plus project Phases 1-2 conditions and buildout plus project Phases 1-2 conditions utilizing the Synchro version 6 software.



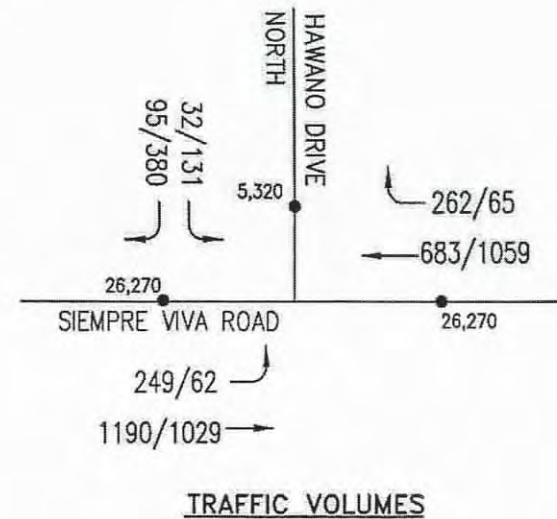
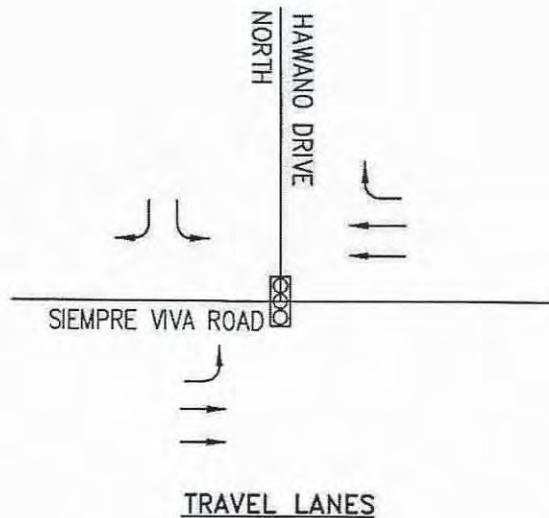
# LEGEND



- - TRAVEL LANE/DIRECTION OF TRAVEL
- o| - STOP SIGN
- XX/YY - AM/PM PEAK HOUR TURN VOLUME
- Z,ZZZ - AVERAGE DAILY TRAFFIC

Darnell & ASSOCIATES, INC.

091201DD.dwg 8-05-11 JM

FIGURE A  
EXISTING PLUS PROJECT PHASES 1-2 CONDITIONS  
AT SIEMPRE VIVA ROAD/ HAWANO DRIVE NORTH

LEGEND

-  - TRAVEL LANE/DIRECTION OF TRAVEL
-  - TRAFFIC SIGNAL
- XX/YY - AM/PM PEAK HOUR TURN VOLUME
- Z,ZZZ - AVERAGE DAILY TRAFFIC

Darnell & ASSOCIATES, INC.

091201DD.dwg 8-18-11 JM

**FIGURE B**  
 BUILDOUT PLUS PROJECT PHASES 1-2 CONDITIONS  
 AT SIEMPRE VIVA ROAD/ HAWANO DRIVE NORTH

The analysis found that under existing plus project Phases 1-2 conditions, all critical movements at the Siempre Viva Road/Hawano Drive North intersection can operate at an acceptable level of service (LOS) C or better during both the AM and PM peak hours with all-way stop-control with the lane configurations depicted in Figure A. Daily signal warrant analysis found that the installation of a traffic signal at the Siempre Viva Road/Hawano Drive North intersection under existing plus Phases 1-2 project conditions, and is therefore, not recommended. Further, the all-way stop-control analysis found that all-way stop-control is warranted at the Siempre Viva Road/Hawano Drive North intersection under existing plus project Phases 1-2 conditions. A copy of the synchro, signal warrant, and all-way stop-control warrant worksheets have been attached to the back of this memo.

Under buildout conditions, the signal warrant analysis found that a traffic signal would be warranted at the Siempre Viva Road/Hawano Drive North intersection. Further, due to the unbalanced traffic volumes that would occur on the approaches (there would be significantly higher traffic volumes on Siempre Viva Road than Hawano Drive North) under buildout conditions, all-way stop-control would not be recommended under buildout conditions. Analysis found that under buildout conditions the southbound left turn movement would operate at an unacceptable LOS E during the AM peak hour and LOS F during the PM peak hour if the intersection was only stop-controlled on the Hawano Drive North (southbound) approach. Therefore, it is recommended that under buildout conditions the Siempre Viva Road/Hawano Drive North intersection be signalized. The analysis found that if signalized, the Siempre Viva Road/Hawano Drive North intersection will operate at an acceptable LOS A during the AM peak hour and LOS B during the PM peak hour under buildout plus project Phases 1-2 conditions with the lane configurations depicted in Figure B. A copy of the synchro, signal warrant, and all-way stop-control warrant worksheets have been attached to the back of this memo.

To determine how long the eastbound left turn lane would need to be, D&A conducted a queuing analysis at the Siempre Viva Road/Hawano Drive North intersection. The queuing analysis was conducted utilizing SimTraffic; a simulation software which uses the input values from the Synchro program. The queuing analysis was conducted for the AM and PM peak hours for the existing plus project Phases 1-2 and buildout plus project Phases 1-2 conditions. Ten (10) simulation runs were conducted for each scenario. To respond to the County's comments, the revised queuing analysis included the following vehicle mix: 78% passenger cars, 8% 2-axle trucks; 4% 3-axle trucks; and 10% 4+-axle trucks. The 2-axle and 3-axle trucks were assumed to have a vehicle length of 35 feet while the 4+-axle trucks were assumed to have a vehicle length of 53 feet. Table 1 provides a summary of the queuing analysis.

Table 1 - Summary of Queuing Analysis													
Peak Hour	Movement	95 <sup>th</sup> Percentile Queue (Feet)											
		Run											
		1	2	3	4	5	6	7	8	9	10	Average	Max
Existing Plus Project Phases 1-2													
AM	EBL	107	107	107	97	116	135	90	92	89	76	102	135
PM	EBL	56	41	63	47	54	57	57	53	45	57	53	63
Buildout Plus Project Phases 1-2													
AM	EBL	296	280	215	214	238	222	310	247	294	256	257	310
PM	EBL	85	94	82	60	80	75	61	71	78	96	78	96
EBL = Eastbound Left 95 <sup>th</sup> Percentile Queue = Is the Maximum Back of Queue with the 95-percentile Traffic Volumes Average = Average of the 95 <sup>th</sup> Percentile Queue Observed; Max = Maximum 95 <sup>th</sup> Percentile Queue Observed													

As shown in Table 1, the maximum 95<sup>th</sup>-percentile queue observed for the eastbound left turn movement was 310 feet. Therefore, it is recommended that the eastbound left turn lane at the Siempre Viva Road/Hawano Drive North Drive intersection be at least 310 feet long.

D&A also looked at the truck turning movements exiting Hawano Drive North onto Siempre Viva Road to determine whether no parking/red curb restrictions would be required on the northwest corner of the intersection. As illustrated in Figure C, a review of the truck turning movements found that approximately 50 feet of no parking/red curb restrictions would be required at the northwest corner of the Siempre Viva Road/Hawano Drive North intersection in order to adequately accommodate the truck turning movements.

Please feel free to contact the office if you have any questions.

# 50' TURNING RADIUS

STA A TRUCK  
SEMITRAILER WHEEL TRACKS  
SCALE IN FEET

150 100 50 0

23+C

Hawano Drive No.

Scale 1" = 40'

Proposed  
50' Red Curb.

SIEMPRE VIVA RD.

Figure C - Truck Turning  
Movements at Siempre Viva Rd/  
Hawano Dr North

BED 8/5/2011

## **ATTACHMENT**

- **Existing Plus Project Phases 1-2 Analysis**
- **Buildout Plus Project Phases 1-2 Analysis**

## **Existing Plus Project Phases 1-2 Analysis**

-All Way Stop Control Warrants

-

**TRAFFIC WARRANT FOR MULTI-WAY STOP CONTROLLED INTERSECTION –  
ADOPTED FROM MUTCD 2009 EDITION (SECTION 2B.07)**

**Intersection:** Siempre Viva Road/Hawano Drive North  
**Condition/Year:** Existing Plus Project Phases 1-2

**I) SUPPORT**

Support Criteria			
1. Is the volume of traffic on the intersecting roads approximately equal?	Peak Hour Volume on Major Street (Siempre Viva Rd)	Peak Hour Volume on Minor Street (Hawano Drive North)	YES
	EB Approach: AM 550, PM 137 WB Approach AM 196, PM 344	SB Approach: AM 127, PM 516	
2. Is there is a safety concern associated with pedestrians, bicyclists, and all other users?	No	Comments: This intersection currently does not exist, however, there is not anticipated to be a high volume of pedestrians or bicycle activity in this area	
3. Can all-way stop control be useful as a safety measure at the intersection?	No	Comments:	

**II) GUIDANCE**

**A. Traffic Signal Warrant**

See Attached Signal Warrants. As shown in the attached signal warrants, a traffic signal will not be warranted at this intersection based on average daily volumes.

**B. Crash Warrants**

Crash History				
Intersection	No. of Crashes	No. of Years	No. of crashes <sup>1</sup> correctable by All-Way Stop	No. of crashes <sup>1</sup> correctable by All-Way Stop $\geq 5$ in 12 month period
Siempre Viva Road @ Hawano Drive North	N/A			

<sup>1</sup> Such crashes include right-and left turn collisions and right-angle collisions

**C. Minimum Volumes**

1. Eight Hour Vehicular Volume on Major Street											
Street	Approach	Hourly Volume								Avg.	$\geq 300$ vph
		7-8 AM	8-9 AM	9-10 AM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	7-8 PM		
Siempre Viva Rd	Major Street (Total of both approaches)	746	723	602	302	386	481	405	336	498	YES

vph = vehicles per hour  
Note: Since this intersection does not currently exist, the volumes were estimated based on the existing traffic splits on Siempre Viva Road at Paseo De Las Americas

2. Eight Hour Vehicular, Pedestrian and Bicycle Volume on Minor Street												
Street	Approach	Travel Mode	Hourly Volume								Avg.	$\geq 200$ uph
			7-8 AM	8-9 AM	9-10 AM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	7-8 PM		
Hawano Dr. North	Minor Street (Total of both approaches)	Veh.	127	123	103	323	414	516	435	360	300	YES
		Ped.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	
		Cyc.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	
		Total	127	123	103	323	414	516	435	360	300	

uph = units per hour; Veh. Tr. = Vehicular Traffic; Nom. = Nominal  
Avg. Delay to Veh. Tr.<sup>1</sup> = Average delay to minor-street vehicular traffic should be at least 30 seconds per vehicle during the highest hour.

All-Way Stop Control Warrant

3. 85 <sup>th</sup> Percentile Approach Speed of Major Street					
Street	Approach	85 <sup>th</sup> Percentile Approach Speed of Major Street	> 40 mph or 65 km/h	If YES is any of the minimum vehicular warrant satisfied	
				70 % of 300 vph	70 % of 200 uph
Siempre Viva Rd	Major Street (Total of both approaches)	55 mph (a)	YES	YES	YES
vph = vehicles per hour; uph = units per hour; mph = miles per hour; km/h = kilometers per hour (a) Since the roadway is not constructed yet the 85 <sup>th</sup> percentile speed was assumed to be the design speed of the roadway					

**A. No. of Criteria Satisfied to 80 percent**

No. of Criteria Satisfied to 80 percent			
Intersection	B	C1	C2
Siempre Viva Road @ Hawano Drive North	YES	YES	YES
Criterion C.3 is excluded from this condition.			

**III) OPTION**

Option Criteria			
	Criterion	Criterion Satisfied	Comments
A.	Need to control left-turn conflicts	YES	There are 393 EBL and 118 SBL projected under existing plus project conditions
B.	Need to control vehicle/ pedestrian conflicts near locations that generate high pedestrian volumes	NO	
C.	Locations where a road user, after stopping, cannot see conflicting traffic and is not able to reasonably safely negotiate the intersection unless conflicting cross traffic is also required to stop; and	NO	
D.	An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where all-way stop control would improve traffic operational characteristics of the intersection.	NO	
Criterion C.3 is excluded from this condition.			

All-Way Stop Control 100 % Warrant Satisfied: YES

All-Way Stop Control 70 % Warrant Satisfied: YES

-Signal Warrants

-

Existing + Project Phases 1-2

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 4)

<table border="0" style="width: 100%;"> <tr> <td style="width: 25%;">DIST</td> <td style="width: 25%;">CO</td> <td style="width: 25%;">RTE</td> <td style="width: 25%;">PM</td> </tr> <tr> <td colspan="4">Major St: <u>Siempre Viva Rd</u></td> </tr> <tr> <td colspan="4">Minor St: <u>Hawano Dr North</u></td> </tr> </table>	DIST	CO	RTE	PM	Major St: <u>Siempre Viva Rd</u>				Minor St: <u>Hawano Dr North</u>				<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">COUNT DATE</td> <td style="width: 50%;"></td> </tr> <tr> <td>CALC. <u>27+</u></td> <td>DATE <u>8-18-11</u></td> </tr> <tr> <td>CHK</td> <td>DATE</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <td style="width: 70%;">Critical Approach Speed</td> <td style="width: 30%; text-align: right;">mph</td> </tr> <tr> <td>Critical Approach Speed <u>55</u></td> <td style="text-align: right;">mph</td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <td style="width: 60%;">Speed limit or critical speed on major street traffic &gt; 64 km/h (40 mph).....</td> <td style="width: 5%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 5%;"></td> <td rowspan="3" style="width: 10%; vertical-align: middle; font-size: 3em;">}</td> <td style="width: 20%;"></td> </tr> <tr> <td></td> <td style="text-align: center;">or</td> <td></td> <td></td> </tr> <tr> <td>In built up area of isolated community of &lt; 10,000 population.....</td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> <td></td> <td>RURAL (R)</td> </tr> <tr> <td></td> <td style="text-align: center;"><input type="checkbox"/></td> <td></td> <td></td> <td>URBAN (U)</td> </tr> </table>	COUNT DATE		CALC. <u>27+</u>	DATE <u>8-18-11</u>	CHK	DATE	Critical Approach Speed	mph	Critical Approach Speed <u>55</u>	mph	Speed limit or critical speed on major street traffic > 64 km/h (40 mph).....	<input checked="" type="checkbox"/>		}			or			In built up area of isolated community of < 10,000 population.....	<input type="checkbox"/>				<input type="checkbox"/>			RURAL (R)		<input type="checkbox"/>			URBAN (U)
DIST	CO	RTE	PM																																											
Major St: <u>Siempre Viva Rd</u>																																														
Minor St: <u>Hawano Dr North</u>																																														
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Speed limit or critical speed on major street traffic > 64 km/h (40 mph).....	<input checked="" type="checkbox"/>		}																																											
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In built up area of isolated community of < 10,000 population.....	<input type="checkbox"/>																																													
	<input type="checkbox"/>			RURAL (R)																																										
	<input type="checkbox"/>			URBAN (U)																																										

### WARRANT 1 - Eight Hour Vehicular Volume

SATISFIED YES ☐ NO ☒

(Condition A or Condition B or combination of A and B must be satisfied)

### Condition A - Minimum Vehicle Volume

100% SATISFIED YES ☐ NO ☒

80% SATISFIED YES ☐ NO ☒

MINIMUM REQUIREMENTS. (80% SHOWN IN BRACKETS)					80% SATISFIED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>								
	U	R	U	R									
APPROACH LANES	1 ↓		2 or More ↓		$\frac{2-8}{1-9} / \frac{9-10}{2-3} / \frac{10-11}{3-4} / \frac{11-12}{4-5} / \frac{12-13}{5-6} / \frac{13-14}{6-7}$ Hour								
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	746	723	602	302	386	481	415	336	
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	127	123	103	323	414	516	435	360	

### Condition B - Interruption of Continuous Traffic

100% SATISFIED YES ☐ NO ☒

80% SATISFIED YES ☐ NO ☒

Same as above

		MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				80% SATISFIED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
		U	R	U	R	Same as above	
APPROACH LANES	1	2 or More					
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)			
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)			

### Combination of Conditions A & B

SATISFIED YES ☐ NO ☒

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes <input type="checkbox"/> No <input type="checkbox"/>
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC	No	
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes <input type="checkbox"/> No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

**Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)**

Siempre Viva Road / Hawano Dr North  
Existing + Project Phases 1-2

**WARRANT 2 - Four Hour Vehicular Volume**

SATISFIED\* YES ☐ NO ☒

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	7-8	8-9	4-5	5-6	Hour
Both Approaches - Major Street	<input type="checkbox"/>	<input checked="" type="checkbox"/>	746	723	481	406	
Higher Approach - Minor Street	<input type="checkbox"/>	<input checked="" type="checkbox"/>	129	123	516	435	

\*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)

Yes ☐ No ☐

OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)

Yes ☐ No ☒

**WARRANT 3 - Peak Hour**

(Part A or Part B must be satisfied)

SATISFIED YES ☒ NO ☐

**PART A**

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

SATISFIED YES ☐ NO ☒

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

**PART B**

SATISFIED YES ☒ NO ☐

APPROACH LANES	One	2 or More	AM	PM	Hour
Both Approaches - Major Street	<input type="checkbox"/>	<input type="checkbox"/>	746	481	
Higher Approach - Minor Street	<input type="checkbox"/>	<input type="checkbox"/>	129	516	

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)

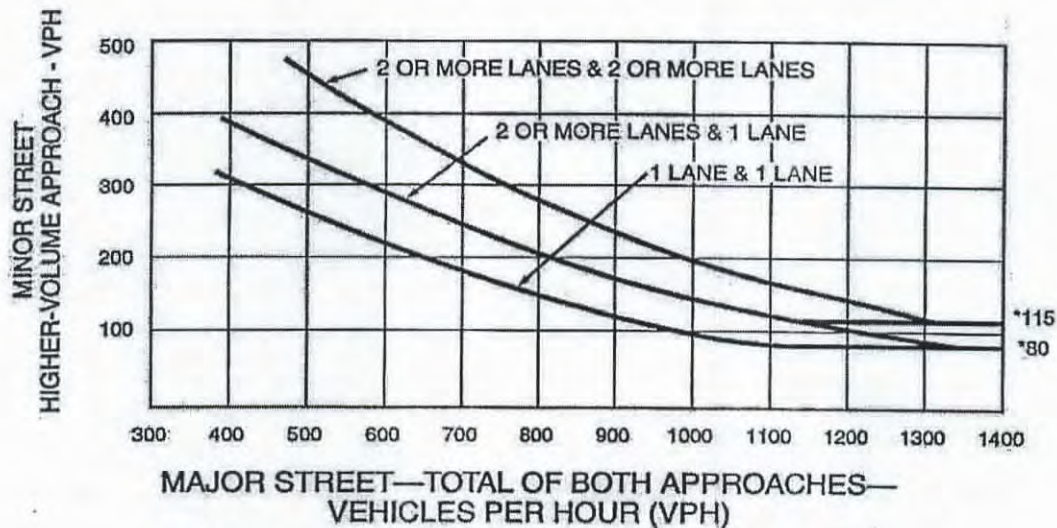
Yes ☐ No ☐

OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)

Yes ☒ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

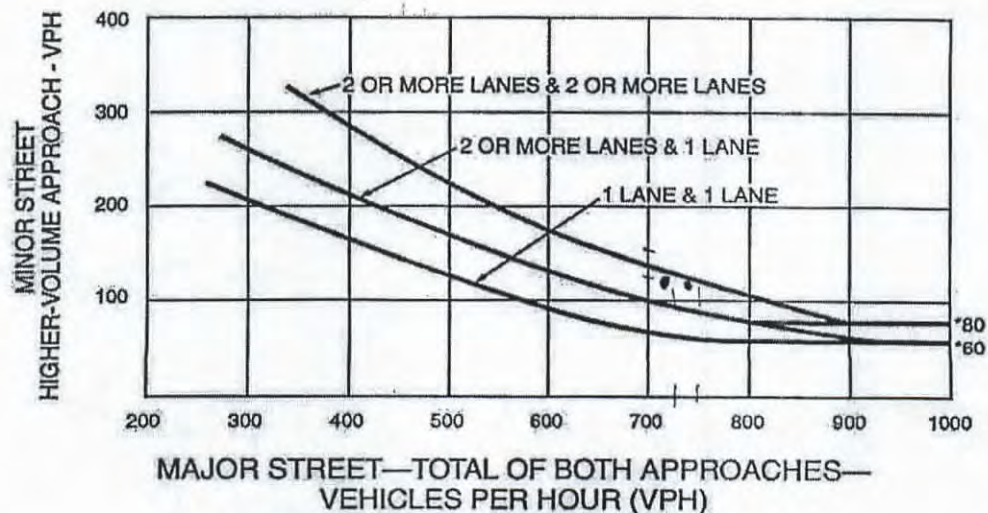
**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume**



\*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)**

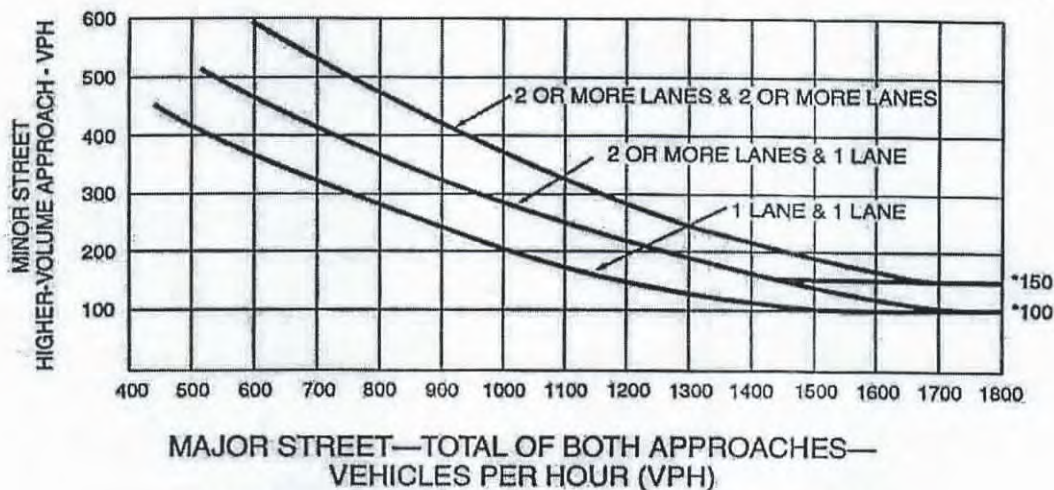
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



\*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

**Figure 4C-3. Warrant 3, Peak Hour**

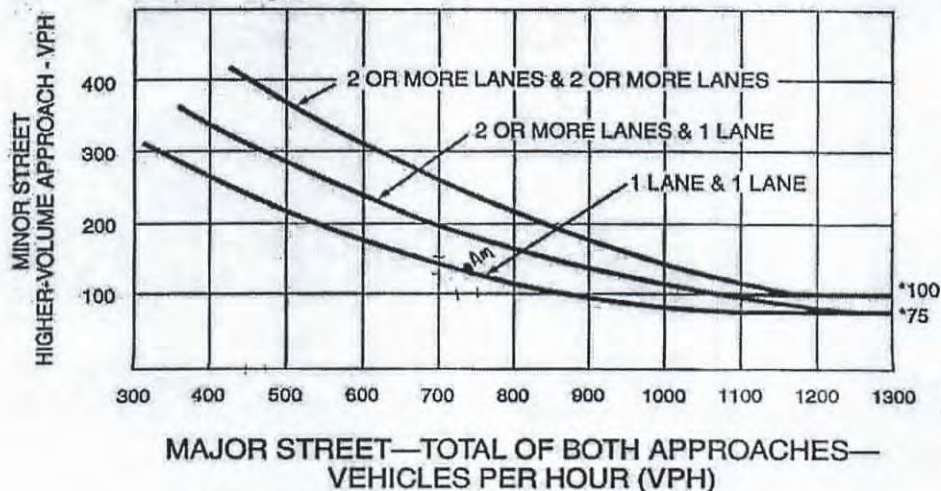
Existing + Project  
Phases 1-2  
Siempre Viva/  
Hawano Dr N



\*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

**Figure 4C-4. Warrant 3, Peak Hour (70% Factor)**

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



\*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

**Figure 4C-103 (CA). Traffic Signal Warrants Worksheet  
(Average Traffic Estimate Form)**

COUNT DATE \_\_\_\_\_  
 CALC ☒ H DATE 8-12-11  
 CHK \_\_\_\_\_ DATE \_\_\_\_\_  
 Major St: Siempre Viva Rd Critical Approach Speed 55 mph  
 Minor St: Hawano Dr North Critical Approach Speed \_\_\_\_\_ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph) ☒ }  
 or }  
 In built up area of isolated community of < 10,000 population ☐ } RURAL (R)  
☐ URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN _____ RURAL <input checked="" type="checkbox"/>		Minimum Requirements EADT			
<b>CONDITION A - Minimum Vehicular Volume</b>		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied _____ Not Satisfied <input checked="" type="checkbox"/>					
Number of lanes for moving traffic on each approach		Urban	Rural	Urban	Rural
Major Street	Minor Street				
1	1	8,000	5,600	2,400	1,680
2 or More	1	9,600	6,720	2,400	1,680
2 or More	2 or More	9,600	6,720	3,200	2,240
1	2 or More	8,000	5,600	3,200	2,240
		5,115		2,660	
<b>CONDITION B - Interruption of Continuous Traffic</b>		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied _____ Not Satisfied <input checked="" type="checkbox"/>					
Number of lanes for moving traffic on each approach		Urban	Rural	Urban	Rural
Major Street	Minor Street				
1	1	12,000	8,400	1,200	850
2 or More	1	14,400	10,080	1,200	850
2 or More	2 or More	14,400	10,080	1,600	1,120
1	2 or More	12,000	8,400	1,600	1,120
		5,115		2,660	
<b>Combination of CONDITIONS A + B</b>		2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied _____ Not Satisfied <input checked="" type="checkbox"/>					
No one condition satisfied, but following conditions fulfilled 80% or more: _____					
A _____ B _____					












**Note:** To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.












The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.












-Synchro Analysis

091201-Hawano  
HCM Unsignalized Intersection Capacity Analysis

85: Siempre Viva Rd & Hawano Dr. North  
Existing + Hawano Phases 1-2- AM-Option 1












						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	393	157	78	118	29	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	427	171	85	128	32	107
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	213				1174	149
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	213				1174	149
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	69				78	88
cM capacity (veh/h)	1357				145	898
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	427	171	213	32	107	
Volume Left	427	0	0	32	0	
Volume Right	0	0	128	0	107	
cSH	1357	1700	1700	145	898	
Volume to Capacity	0.31	0.10	0.13	0.22	0.12	
Queue Length 95th (ft)	34	0	0	20	10	
Control Delay (s)	8.9	0.0	0.0	36.5	9.5	
Lane LOS	A			E	A	
Approach Delay (s)	6.3		0.0	15.7		
Approach LOS				C		
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			46.4%		ICU Level of Service	A
Analysis Period (min)			15			

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	98	39	315	29	118	393
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	107	42	342	32	128	427
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	374				614	358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374				614	358
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				69	38
cM capacity (veh/h)	1185				415	686
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	107	42	374	128	427	
Volume Left	107	0	0	128	0	
Volume Right	0	0	32	0	427	
cSH	1185	1700	1700	415	686	
Volume to Capacity	0.09	0.02	0.22	0.31	0.62	
Queue Length 95th (ft)	7	0	0	32	109	
Control Delay (s)	8.3	0.0	0.0	17.5	18.5	
Lane LOS	A			C	C	
Approach Delay (s)	6.0		0.0	18.3		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			10.2			
Intersection Capacity Utilization			49.3%	ICU Level of Service	A	
Analysis Period (min)			15			

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	393	157	78	118	29	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	427	171	85	128	32	107
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	427	171	213	32	107	
Volume Left (vph)	427	0	0	32	0	
Volume Right (vph)	0	0	128	0	107	
Hadj (s)	0.53	0.03	-0.33	0.53	-0.67	
Departure Headway (s)	5.7	5.2	5.1	7.0	5.8	
Degree Utilization, x	0.67	0.24	0.30	0.06	0.17	
Capacity (veh/h)	620	681	685	476	569	
Control Delay (s)	18.3	8.6	10.2	9.2	8.7	
Approach Delay (s)	15.5		10.2	8.8		
Approach LOS	C		B	A		
Intersection Summary						
Delay			13.4			
HCM Level of Service			B			
Intersection Capacity Utilization			46.4%	ICU Level of Service		A
Analysis Period (min)			15			

091201-Hawano  
 HCM Unsignalized Intersection Capacity Analysis

85: Siempre Viva Rd & Hawano Dr. North  
 Existing + Hawano Phases 1-2- PM-Option 1

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	98	39	315	29	118	393
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	107	42	342	32	128	427
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	107	42	374	128	427	
Volume Left (vph)	107	0	0	128	0	
Volume Right (vph)	0	0	32	0	427	
Hadj (s)	0.53	0.03	-0.02	0.53	-0.67	
Departure Headway (s)	7.2	6.7	6.0	6.6	5.4	
Degree Utilization, x	0.21	0.08	0.62	0.24	0.64	
Capacity (veh/h)	467	499	581	526	637	
Control Delay (s)	10.9	9.0	18.4	10.4	16.4	
Approach Delay (s)	10.4		18.4	15.0		
Approach LOS	B		C	C		
<b>Intersection Summary</b>						
Delay			15.5			
HCM Level of Service			C			
Intersection Capacity Utilization			49.3%	ICU Level of Service	A	
Analysis Period (min)			15			

## **Buildout Plus Project Phases 1-2 Analysis**

-All Way Stop Control Warrants

**TRAFFIC WARRANT FOR MULTI-WAY STOP CONTROLLED INTERSECTION –  
ADOPTED FROM MUTCD 2009 EDITION (SECTION 2B.07)**

Intersection: **Siempre Viva Road/Hawano Drive North**  
Condition/Year: **Buildout Plus Project Phases 1-2**

**D) SUPPORT**

Support Criteria			
1. Is the volume of traffic on the intersecting roads approximately equal?	Peak Hour Volume on Major Street (Siempre Viva Rd)	Peak Hour Volume on Minor Street (Hawano Drive North)	NO
	EB Approach: AM 1,439; PM 945 WB Approach AM 1,091; PM 1,124	SB Approach: AM 127, PM 511	
2. Is there is a safety concern associated with pedestrians, bicyclists, and all other users?	No	Comments: This intersection currently does not exist, however, there is not anticipated to be a high volume of pedestrians or bicycle activity in this area	
3. Can all-way stop control be useful as a safety measure at the intersection?	No	Comments:	

**II) GUIDANCE**

**A. Traffic Signal Warrant**

See Attached Signal Warrants. As shown in the attached signal warrants, a traffic signal will be warranted under buildout plus project conditions based on average daily conditions, the estimated four-hour volumes, and the estimated peak hour volume conditions.

**B. Crash Warrants**

Crash History				
Intersection	No. of Crashes	No. of Years	No. of crashes <sup>1</sup> correctable by All-Way Stop	No. of crashes <sup>1</sup> correctable by All-Way Stop $\geq 5$ in 12 month period
<b>Siempre Viva Road @ Hawano Drive North</b>	N/A			

<sup>1</sup> Such crashes include right-and left turn collisions and right-angle collisions

**C. Minimum Volumes**

1. Eight Hour Vehicular Volume on Major Street											
Street	Approach	Hourly Volume								Avg.	$\geq 300$ vph
		7-8 AM	8-9 AM	9-10 AM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	7-8 PM		
<b>Siempre Viva Rd</b>	Major Street (Total of both approaches)	2,384	2,310	1,925	1,388	1,779	2,215	1,866	1,545	1,927	YES

vph = vehicles per hour  
Note: Since this intersection does not currently exist, the volumes were estimated based on the existing traffic splits on Siempre Viva Road at Paseo De Las Americas

2. Eight Hour Vehicular, Pedestrian and Bicycle Volume on Minor Street													
Street	Approach	Travel Mode	Hourly Volume								Avg.	$\geq 200$ uph	Avg. Delay to Veh. Tr. <sup>1</sup>
			7-8 AM	8-9 AM	9-10 AM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	7-8 PM			
<b>Hawano Dr. North</b>	Minor Street (Total of both approaches)	Veh.	127	123	103	320	410	511	430	356	298	YES	AM Peak SBL Delay = 36.5 sec/veh
		Ped.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.		
		Cyc.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.		
		Total	127	123	103	323	414	516	435	360	300		

uph = units per hour; Veh. Tr. = Vehicular Traffic; Nom. = Nominal  
Avg. Delay to Veh. Tr.<sup>1</sup> = Average delay to minor-street vehicular traffic should be at least 30 seconds per vehicle during the highest hour.

3. 85 <sup>th</sup> Percentile Approach Speed of Major Street					
Street	Approach	85 <sup>th</sup> Percentile Approach Speed of Major Street	> 40 mph or 65 km/h	If YES is any of the minimum vehicular warrant satisfied	
				70 % of 300 vph	70 % of 200 uph
Siempre Viva Rd	Major Street (Total of both approaches)	55 mph (a)	YES	YES	YES
vph = vehicles per hour; uph = units per hour; mph = miles per hour; km/h = kilometers per hour (a) Since the roadway is not constructed yet the 85 <sup>th</sup> percentile speed was assumed to be the design speed of the roadway					

**A. No. of Criteria Satisfied to 80 percent**

No. of Criteria Satisfied to 80 percent			
Intersection	B	C1	C2
Siempre Viva Road @ Hawano Drive North	YES	YES	YES
Criterion C.3 is excluded from this condition.			

**III) OPTION**

Option Criteria			
Criterion		Criterion Satisfied	Comments
A.	Need to control left-turn conflicts	YES	There are 249 EBL and 131 SBL projected under buildout plus project conditions
B.	Need to control vehicle/ pedestrian conflicts near locations that generate high pedestrian volumes	NO	
C.	Locations where a road user, after stopping, cannot see conflicting traffic and is not able to reasonably safely negotiate the intersection unless conflicting cross traffic is also required to stop; and	NO	
D.	An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where all-way stop control would improve traffic operational characteristics of the intersection.	NO	
Criterion C.3 is excluded from this condition.			

**All-Way Stop Control 100 % Warrant Satisfied:** YES, However – since the traffic volumes are not balanced, an all-way stop-control is not recommended under buildout conditions. Rather, since a traffic signal is warranted, a traffic signal is recommended under buildout conditions.

**All-Way Stop Control 70 % Warrant Satisfied:** YES, However – since the traffic volumes are not balanced, an all-way stop-control is not recommended under buildout conditions. Rather, since a traffic signal is warranted, a traffic signal is recommended under buildout conditions.

-Signal Warrants

**Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 4)**

**Buildout + Project**

COUNT DATE \_\_\_\_\_

CALC. CH DATE 8-18-11

CHK \_\_\_\_\_ DATE \_\_\_\_\_

DIST \_\_\_\_\_ CO \_\_\_\_\_ RTE \_\_\_\_\_ PM \_\_\_\_\_

Major St: Siempre Viva Rd

Minor St: Hawano Dr North

Critical Approach Speed \_\_\_\_\_ mph

Critical Approach Speed 55 mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☒ } **RURAL (R)**

In built up area of isolated community of < 10,000 population..... ☐ } **URBAN (U)**

**WARRANT 1 - Eight Hour Vehicular Volume** SATISFIED YES ☐ NO ☒  
(Condition A or Condition B or combination of A and B must be satisfied)

**Condition A - Minimum Vehicle Volume** 100% SATISFIED YES ☐ NO ☒  
80% SATISFIED YES ☐ NO ☒

MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)					80% SATISFIED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>							
	U	R	U	R								
APPROACH LANES	1		2 or More		7-8 / 8-9 / 9-10 / 10-11 / 11-12 / 12-1 / 1-2 / 2-3 / 3-4 / 4-5 / 5-6 / 6-7 Hour							
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	2381	2316	1925	1388	1779	2215	1866	1545
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	127	123	103	320	410	511	430	356

**Condition B - Interruption of Continuous Traffic** 100% SATISFIED YES ☐ NO ☒  
80% SATISFIED YES ☒ NO ☐

MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)					80% SATISFIED: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>										
		U	R			U	R								
APPROACH LANES		1		2 or More		Same as above								Hour	
Both Approaches Major Street		750 (600)	525 (420)	900 (720)	630 (504)										
Highest Approach Minor Street		75 (60)	53 (42)	100 (80)	70 (56)										

**Combination of Conditions A & B** SATISFIED YES ☐ NO ☒

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME	No	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC	✓	
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes <input type="checkbox"/> No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)

Buildout + Hawano Phases 1-2

**WARRANT 2 - Four Hour Vehicular Volume**SATISFIED\* YES ☒ NO ☐

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	7-8	8-9	9-10	10-11	Hour
Both Approaches - Major Street	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2384	2310	2215	1866	
Higher Approach - Minor Street	<input type="checkbox"/>	<input checked="" type="checkbox"/>	127	123	511	430	

\*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)

Yes ☐ No ☐

OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)

Yes ☒ No ☐**WARRANT 3 - Peak Hour**  
(Part A or Part B must be satisfied)SATISFIED YES ☒ NO ☐**PART A**SATISFIED YES ☐ NO ☒

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND <i>pm = 2.6 veh-hrs</i>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**PART B**SATISFIED YES ☒ NO ☐

APPROACH LANES	One	2 or More	7-8 AM	PM	Hour
Both Approaches - Major Street	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2384	2215	
Higher Approach - Minor Street	<input type="checkbox"/>	<input checked="" type="checkbox"/>	127	511	

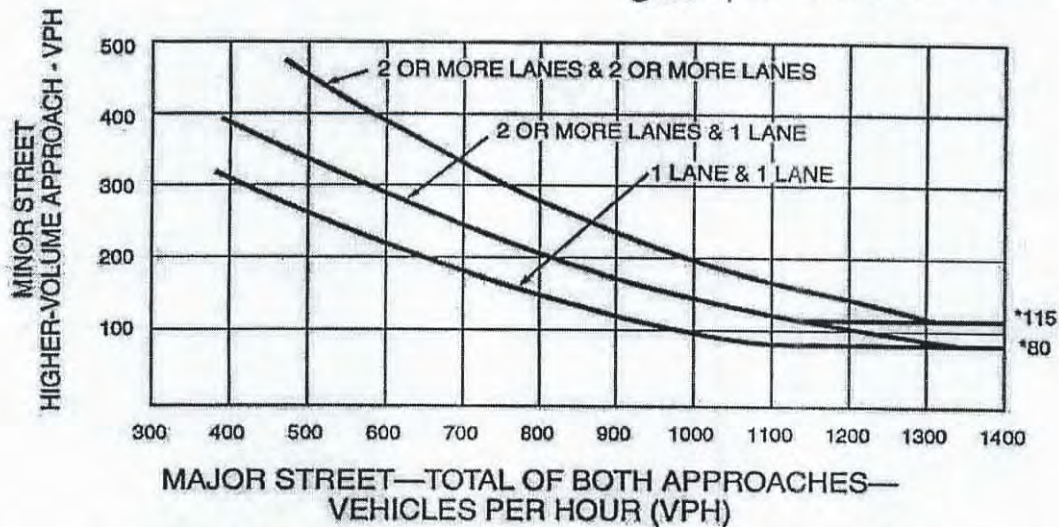
The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

*Buildout + Project*

**Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume**

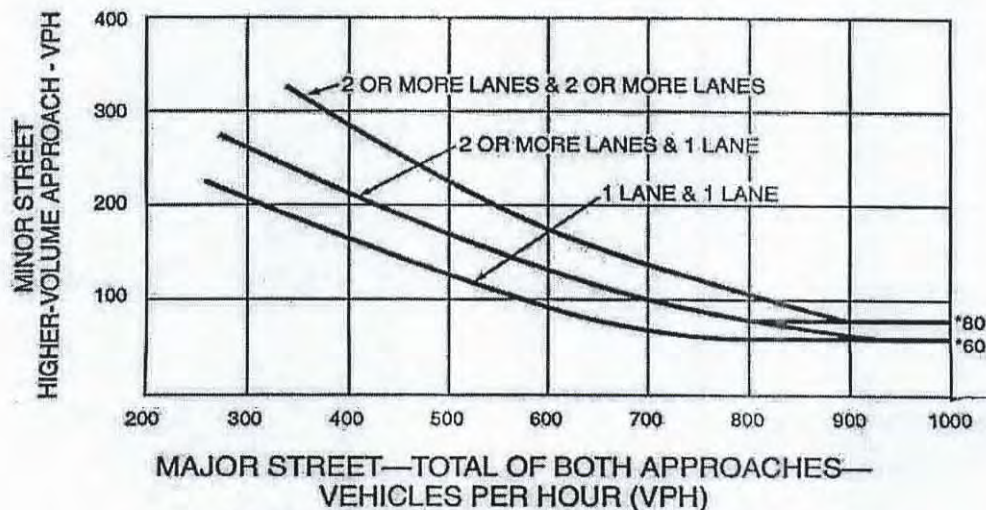
*Siempre Viva / Hawano Dr North*



\*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

**Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)**

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

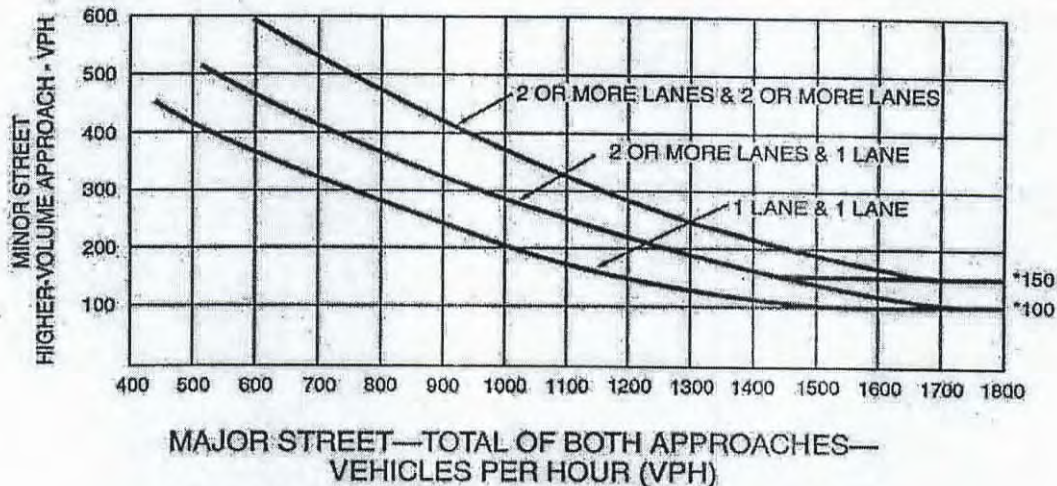


\*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

*Buildout + Project*

**Figure 4C-3. Warrant 3, Peak Hour**

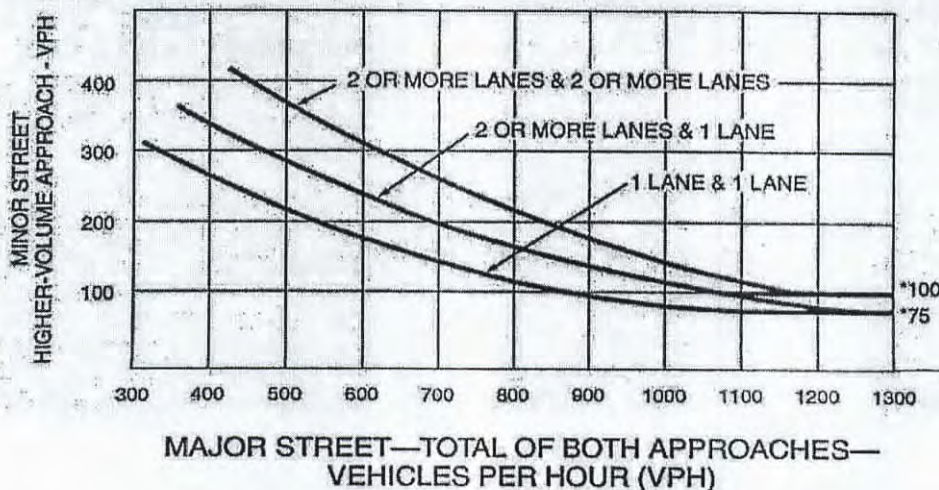
*Siempre Viva / Hawaro Drive North*



\*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

**Figure 4C-4. Warrant 3, Peak Hour (70% Factor)**

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



\*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

**Figure 4C-103 (CA). Traffic Signal Warrants Worksheet  
(Average Traffic Estimate Form)**

Buildout +  
Hawano  
Phases 1-2

COUNT DATE \_\_\_\_\_  
CALC WH DATE 8-04-11  
CHK \_\_\_\_\_ DATE \_\_\_\_\_

DIST \_\_\_\_\_ CO \_\_\_\_\_ RTE \_\_\_\_\_ PM \_\_\_\_\_  
Major St: Siempre Viva Rd  
Minor St: Hawano Dr North

Critical Approach Speed \_\_\_\_\_ mph  
Critical Approach Speed \_\_\_\_\_ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☒ }  
In built up area of isolated community of < 10,000 population..... ☐ } **RURAL (R)**  
☐ **URBAN (U)**













(Based on Estimated Average Daily Traffic - See Note)

URBAN.....		RURAL..... <input checked="" type="checkbox"/>		Minimum Requirements EADT			
<b>CONDITION A - Minimum Vehicular Volume</b>				Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied <input checked="" type="checkbox"/> Not Satisfied _____							
Number of lanes for moving traffic on each approach							
Major Street		Minor Street		Urban	Rural	Urban	Rural
1.....		1.....		8,000	5,600	2,400	1,680
2 or More.....		1.....		9,600	6,720	2,400	1,680
2 or More.....		2 or More.....		9,600	6,720	3,200	2,240
1.....		2 or More.....		8,000	5,600	3,200	2,240
				26,270		2668	
<b>CONDITION B - Interruption of Continuous Traffic</b>				Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied <input checked="" type="checkbox"/> Not Satisfied _____							
Number of lanes for moving traffic on each approach							
Major Street		Minor Street		Urban	Rural	Urban	Rural
1.....		1.....		12,000	8,400	1,200	850
2 or More.....		1.....		14,400	10,080	1,200	850
2 or More.....		2 or More.....		14,400	10,080	1,600	1,120
1.....		2 or More.....		12,000	8,400	1,600	1,120
				26,270		2668	
<b>Combination of CONDITIONS A + B</b>				2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied <input checked="" type="checkbox"/> Not Satisfied _____							
No one condition satisfied, but following conditions fulfilled 80% or more..... <input checked="" type="checkbox"/> A <input checked="" type="checkbox"/> B							

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.













The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

-Synchro Analysis

								
Movement	EBL	EBT	WBT	WBR	SBL	SBR		
Lane Configurations								
Sign Control		Free	Free		Stop			
Grade		0%	0%		0%			
Volume (veh/h)	249	1190	683	262	32	95		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Hourly flow rate (vph)	262	1253	719	276	34	100		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					Raised			
Median storage (veh)					1			
Upstream signal (ft)			624					
pX, platoon unblocked	0.95				0.95	0.95		
vC, conflicting volume	995				1869	359		
vC1, stage 1 conf vol					719			
vC2, stage 2 conf vol					1151			
vCu, unblocked vol	942				1863	273		
tC, single (s)	4.1				6.8	6.9		
tC, 2 stage (s)					5.8			
tF (s)	2.2				3.5	3.3		
p0 queue free %	62				73	85		
cM capacity (veh/h)	688				123	688		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	262	626	626	359	359	276	34	100
Volume Left	262	0	0	0	0	0	34	0
Volume Right	0	0	0	0	0	276	0	100
cSH	688	1700	1700	1700	1700	1700	123	688
Volume to Capacity	0.38	0.37	0.37	0.21	0.21	0.16	0.27	0.15
Queue Length 95th (ft)	45	0	0	0	0	0	26	13
Control Delay (s)	13.4	0.0	0.0	0.0	0.0	0.0	45.1	11.1
Lane LOS	B						E	B
Approach Delay (s)	2.3			0.0			19.7	
Approach LOS							C	
Intersection Summary								
Average Delay			2.3					
Intersection Capacity Utilization			46.0%		ICU Level of Service		A	
Analysis Period (min)			15					













091201-Hawano  
HCM Unsignalized Intersection Capacity Analysis

85: Siempre Viva Rd & Hawano Dr. North  
Buildout + Hawano Phases 1-2- PM

									
Movement	EBL	EBT	WBT	WBR	SBL	SBR			
Lane Configurations									
Sign Control		Free	Free		Stop				
Grade		0%	0%		0%				
Volume (veh/h)	62	1029	1059	65	131	380			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95			
Hourly flow rate (vph)	65	1083	1115	68	138	400			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type					Raised				
Median storage veh)					1				
Upstream signal (ft)	624								
pX, platoon unblocked	0.84					0.84	0.84		
vC, conflicting volume	1183					1787	557		
vC1, stage 1 conf vol					1115				
vC2, stage 2 conf vol					672				
vCu, unblocked vol	1026					1746	280		
tC, single (s)	4.1					6.8	6.9		
tC, 2 stage (s)					5.8				
tF (s)	2.2					3.5	3.3		
p0 queue free %	88					23	33		
cM capacity (veh/h)	564					179	601		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1	SB 2	
Volume Total	65	542	542	557	557	68	138	400	
Volume Left	65	0	0	0	0	0	138	0	
Volume Right	0	0	0	0	0	68	0	400	
cSH	564	1700	1700	1700	1700	1700	179	601	
Volume to Capacity	0.12	0.32	0.32	0.33	0.33	0.04	0.77	0.67	
Queue Length 95th (ft)	10	0	0	0	0	0	127	124	
Control Delay (s)	12.2	0.0	0.0	0.0	0.0	0.0	71.7	22.1	
Lane LOS	B					F C			
Approach Delay (s)	0.7	0.0				34.8			
Approach LOS					D				
Intersection Summary									
Average Delay	6.8								
Intersection Capacity Utilization	59.5%				ICU Level of Service		B		
Analysis Period (min)	15								

091201-Hawano  
Lanes, Volumes, Timings

85: Siempre Viva Rd & Hawano Dr. North  
Buildout + Hawano Phases 1-2- AM-With Signal at Hawano North

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	3539	3539	1583	1770	1583
Satd. Flow (RTOR)				276		100
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Volume (vph)	249	1190	683	262	32	95
Adj. Flow (vph)	262	1253	719	276	34	100
Lane Group Flow (vph)	262	1253	719	276	34	100
Turn Type	Prot			Perm		Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Total Split (s)	34.0	72.2	38.2	38.2	25.8	25.8
Act Effct Green (s)	30.0	82.1	48.1	48.1	7.9	7.9
Actuated g/C Ratio	0.31	0.84	0.49	0.49	0.08	0.08
v/c Ratio	0.48	0.42	0.41	0.30	0.24	0.45
Control Delay	31.4	2.6	7.4	1.4	45.5	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	2.6	7.4	1.4	45.5	15.7
LOS	C	A	A	A	D	B
Approach Delay		7.6	5.7		23.3	
Approach LOS		A	A		C	

Intersection Summary

Cycle Length: 98

Actuated Cycle Length: 98

Offset: 26 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 7.7

Intersection LOS: A

Intersection Capacity Utilization 46.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 85: Siempre Viva Rd & Hawano Dr. North

